INCH-POUND

MIL-DTL-22529D(AS)
6 June 1996
SUPERSEDING
MIL-DTL-22529C(AS)
8 September 1995

DETAIL SPECIFICATION

GROMMET, EDGING

This specification is approved for use by the Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers three types of edging grommets; a plastic caterpillar style applied with an adhesive, and two spring-style, stainless steel based composite grommets requiring no adhesives. Edging grommets are used to provide abrasion protection of electrical current carrying wires and cable bundles routed through metal structures.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Defense Industrial Supply Center, 700 Robbins Avenue, DISC-EED, Philadelphia, PA 19111-5096 by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5325

SPECIFICATIONS

FEDERAL

TT-I-735	-	Isopropyl Alcohol
PPP-H-1581	-	Hardware (Fasteners And Related Items) Packaging Of

DEPARTMENT OF DEFENSE

MIL-H-5606	-	Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance
MIL-T-5624	-	Turbine Fuels, Aviation Grades JP-4, JP-5, and 5/JP-8 ST
MIL-L-7808	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-129	-	Marking for Shipment and Storage (Part 1 of 4 Parts)
MIL-STD-202	-	Electronic and Electrical Component Parts, Test Methods For
MS21266	-	Grommet, Edging, Plastic
MIL-DTL-22529/1	-	Grommet, Composite, Edging
MIL-DTL-22529/2	-	Grommet, Cushion, Composite, Edging

(Unless otherwise indicated, copies of specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issue of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D1457	-	Standard Specification for Polytetrafluoroethylene (PTFE) Molding and Extrusion Materials
ASTM D4066	-	Standard Specification for Nylon Inspection and Extrusion Material

(Copies of ASTM publication may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

MUNSELL COLOR COMPANY, INC.

Munsell Book of Color

(Copies of the Munsell Book of Color may be obtained from the Munsell Color Company, Inc., 2441 N. Calvert Street, Baltimore, MD 21218-5204.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual grommet requirements shall be in accordance with MS21266 or MIL-DTL-22529/1 and MIL-DTL-22529/2. In the event of any conflict between requirements of this specification and the Specification Sheets, the latter shall govern.

3.2 Performance.

3.2.1 Dielectric withstanding voltage (dielectric strength). There shall be no disruptive discharge, nor any deterioration of the grommet when subjected to Dielectric Strength Test specified in 4.2.9. This requirement shall be modified per MIL-DTL-22529/1 and MIL-DTL-22529/2.

3.2.2 Immersion. The grommets shall show no evidence of cracking, pitting or material failure, after subjection to the immersion test specified in 4.2.5.

3.2.3 Temperature cycling. The grommets shall show no evidence of cracking, pitting or material failure, after subjection to the temperature test specified in 4.2.6.

3.2.4 High temperature and load deformation. Dimension “T”, shown on Figure 2 (Section “AA”), shall be not less than one-half that of an untested grommet of same type and size upon completion of the high temperature and load deformation test (4.2.7)

3.2.5 Vibration. The grommets shall show no evidence of cracking, pitting or material failure, after subjection to the vibration test specified in 4.2.8.

3.3 Color. The nylon grommets shall be white and shall have a value not less than 9.0 as specified by the Munsell Book of Color. The polytetrafluoroethylene (TFE) shall be neutral color (light gray) having a chroma not greater than 1.0 and having a value not less than 6.0 or greater than 8.0 as defined by the Munsell Book of Color. The composite Grommet type MIL-DTL-22529/1 shall be brown per FED-STD-595, color number 10075, and the MIL-DTL-22529/2 shall be black.

3.4 Identification of Product. Each grommet shall have the MS part number and the manufacturer’s identification on the outer surface. Nylon and TFE grommet types will be molded on the outer surface. The composite grommet type printed.

3.5 Workmanship. The general appearance shall reflect highest standard of workmanship, uniformity of quality and freedom from defects or foreign matter which could adversely affect safety, performance, reliability or durability of the grommets.

4. VERIFICATION

4.1 Classification of inspection. The inspection of all grommets shall be classified as conformance inspections (see 4.2).

4.2 Conformance inspections. Quality conformance inspection shall be as specified in Table I. Sampling shall be based upon a zero-based acceptance plan outlined in Table II. ANSI/ASQCZ1.4 shall be used as a guide in the development of contractors' statistical techniques to assure the grommets meet all requirements specified herein.

TABLE I. Conformance inspection.

Inspection	Level	Test Paragraph
Dimensions	Major	4.2.3
Immersion	Major	4.2.5
Temperature cycling	Major	4.2.6
High temperature and load deformation	Major	4.2.7
Vibration	Major	4.2.8
Dielectric withstand Voltage	Major	4.2.9

TABLE II
"C = O" TABLE
INDEX VALUES 1/

Lot Size	Sample Size (Acceptance number in all cases is zero. "A" indicates the entire lot must be inspected.		
	Critical	Major	Minor
1-8	A	A	3
9-15	A	13	3
16-25	A	13	3
26-50	A	13	3
51-90	A	13	6
91-150	A	13	7
151-280	A	20	10
281-500	A	29	11
501-1200	A	34	15
1201-3200	1250	42	18
3201-10,000	1250	50	22
10,001-35,000	1250	60	29
35,001-150,000	1250	74	29
150,001-500,000	1250	90	29
500,001 & over	1250	102	29

1/ Index Values to be used on the "C = O" table shall be:

Critical Characteristics (where 100% inspection is not specified)	.010%
Major Characteristics	1.0%
Minor Characteristics	4.0%

4.2.1 Inspection lot. An inspection lot shall consist of all grommets of the same size produced under essentially the same conditions and offered for inspection at one time.

4.2.2 Sampling plan. Samples shall be selected at random, from each production lot, in accordance with Table I and II.

4.2.3 Dimensions. The grommets shall be checked dimensionally to determine conformance to the dimensions specified on the applicable specification sheet.

4.2.4 Preparation for delivery. Each of the fully prepared shipping containers, containing grommets, shall be visually examined to determine that the packaging, packing and marking conform to the requirements of Section 5.

4.2.5 Immersion test. With the following fluids heated to, and maintained at a temperature of 50° + 2° - 0°C, two grommet assemblies (se 6.3.1) shall be immersed in each of the fluids for a minimum of one hour.

a. Isopropyl Alcohol conforming to TT-I-735

b. Hydraulic Fluid, Petroleum base, Aircraft Missile and Ordnance, conforming to MIL-H-5606

c. Turbine fuel, Aviation Grades JP-4, JP-5 and 5/JP-8 ST conforming to MIL-T-5624

d. Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, conforming to MIL-L-7808

e. Upon completion of the immersion test, the grommet assembly shall be wiped dry and shall remain for 1 hour in free air at room temperature. The grommets shall conform to the requirements specified in 3.2.2. The grommets shall then be subjected to and pass the dielectric strength test (see 4.2.9).

4.2.6 Temperature cycling test. Grommets shall be tested in accordance with MIL-STD-202, Method 102A, Condition D, except Step 3 shall be per Table III.

Table III

Grommet Type	+3°-0°C
MIL-DTL-22529/2	82°
Nylon MS21266	125°
MIL-DTL-22529/1	142°
TFE MS21266	275°

The grommets shall conform to the requirements specified in 3.2.3. The grommets shall then be subjected to, and pass the dielectric strength test (see 4.2.9).

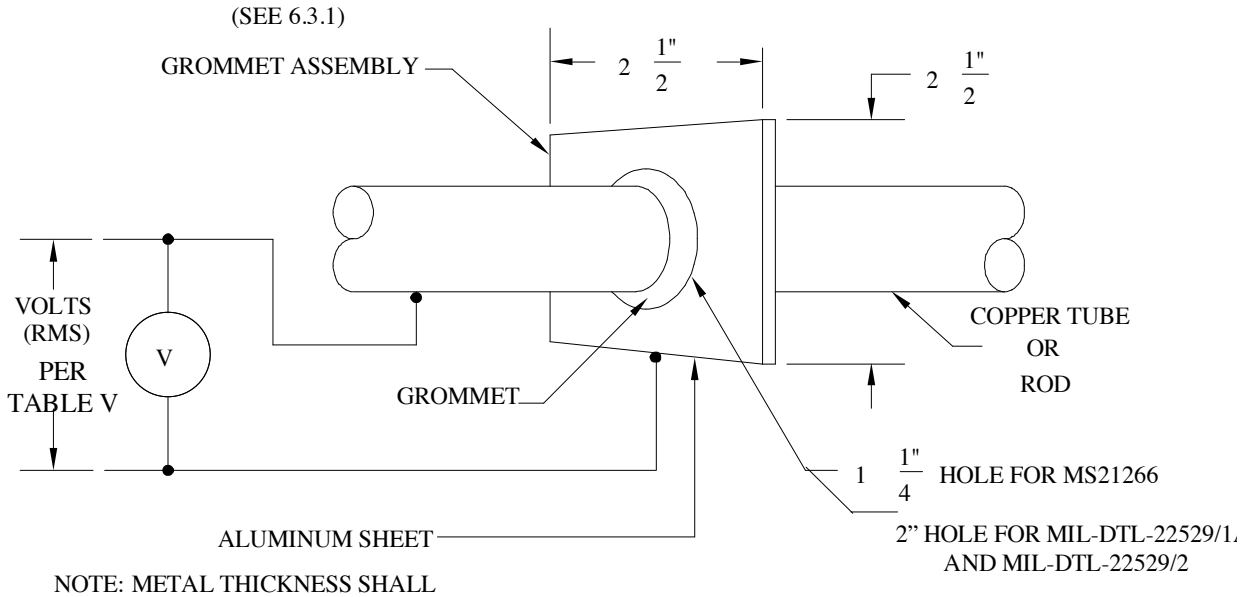
4.2.7 High temperature and load deformation test. The grommets shall be mounted in the test fixture as shown in Figure 2. The fixture with the grommet, shall be placed in an ambient temperature for not less than 48 hours per Table IV.

Table IV

Grommet Type	+2°C
MIL-DTL-22529/2	80°
Nylon MS21266	100°
MIL-DTL-22529/1	120°
TFE MS21266	250°

After returning to room temperature, the grommet area subjected to maximum compression shall be cut to expose section "AA" of Figure 2. The grommet dimensions shall conform to the requirements of 3.2.4.

4.2.8 Vibration test. The grommets shall be mounted in the test fixture as shown in Figure 1, and subjected to the vibration test in accordance with MIL-STD-202, Method 201A. The grommets shall conform to the requirements specified in 3.2.5. Upon completion of the vibration test, the grommets shall be subjected to and pass the dielectric strength test (see 4.2.9).



NOTE: METAL THICKNESS SHALL CORRESPOND TO APPLICABLE DASH NUMBER ON MS21266, MIL-DTL-22529/1A AND MIL-DTL-22529/2

FIGURE 1. Dielectric strength test fixture.

4.2.9 Dielectric withstanding voltage test (dielectric strength). The grommet shall be installed in the dielectric strength test fixture as indicated in Figure 1 and tested in accordance with MIL-STD-202, Method 301.

A voltage shall be applied between the copper rod (tube) and the aluminum sheet per TABLE V. These grommets are primarily intended to provide chafing protection.

Table V

Grommet Type	Volts Potential 60 Hertz (Hz)
MIL-DTL-22529/1	500
MIL-DTL-22529/2	500
MS21266	1500

The specified voltage shall be reached in not less than ten seconds and not more than thirty seconds. The grommets shall conform to the requirements specified in 3.2.1.

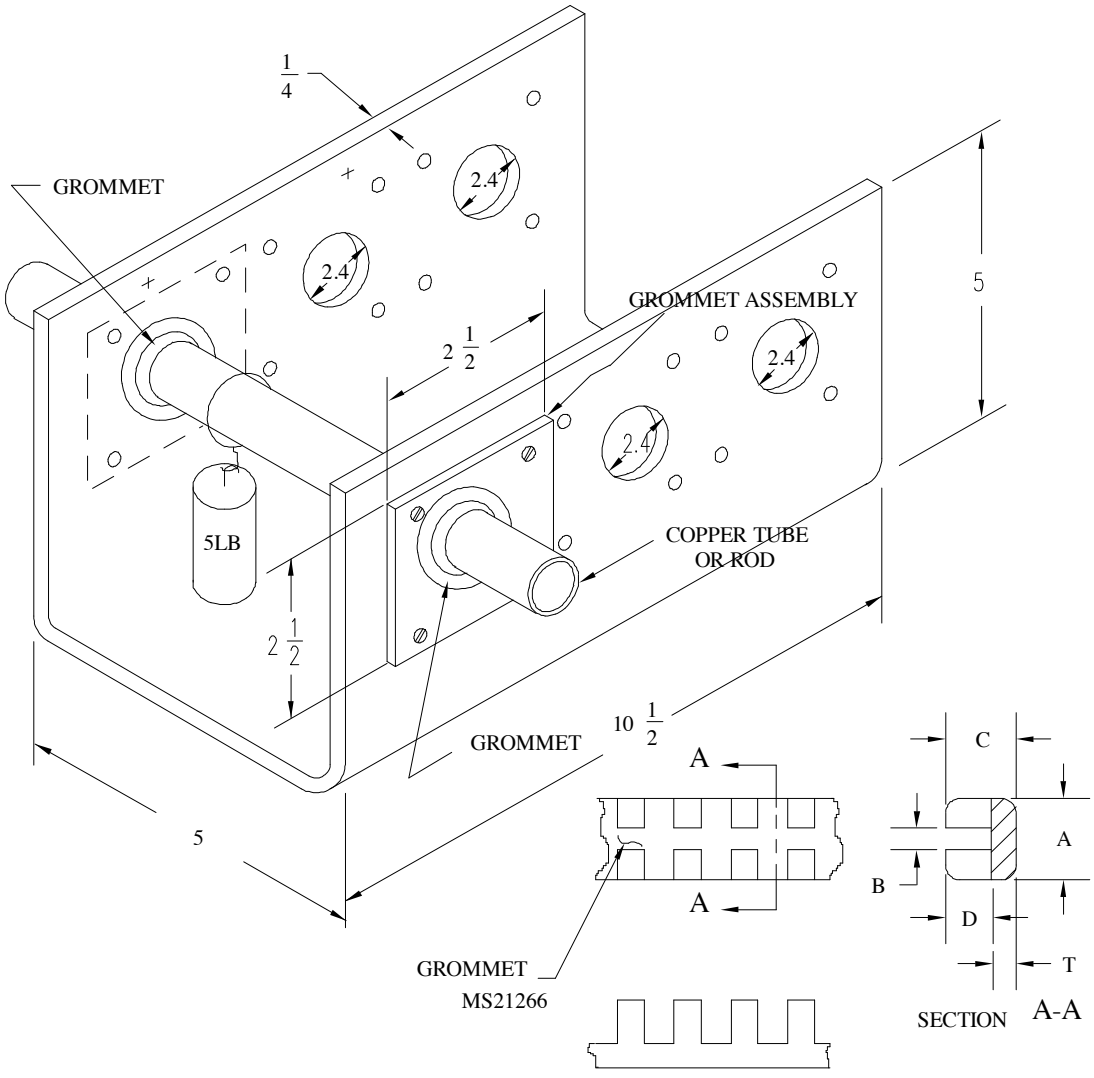


FIGURE 2. Load deformation test fixture.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Plastic and composite grommets covered by this specification are intended to protect from abrasion electrical current carrying wire and cable bundles that are routed through metal structures. The grommets are for use in locations where the ambient temperature does not exceed temperatures shown in Table VI or in areas where there is risk of adhesive failure or embrittlement of grommets. The grommets are intended for edge dressing, odd shape holes and circular holes.

Table VI

Grommet Type	Continuous Ambient Temperature
MIL-DTL-22529/2	85°
Nylon MS 21266	125°
MIL-DTL-22529/1	145°
TFE MS21266	275°

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Applicable MS Part Numbers, MIL-DTL-22529/1 or /2.

c. The level of preservation and packaging required (see 5.1)

6.3 Definition.

6.3.1 Grommet assembly. A grommet inserted into a 2-1/2 inch square aluminum sheet.

6.4 Subject term (key word) listing.

Grommet, assembly
Grommet, composite
Grommet, cushion, composite
Grommet, plastic

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Navy - AS

Preparing activity:
DLA-IS

(Project 5325-0340)