

MIL-G-17927C  
24 December 1986  
SUPERSEDING  
MIL-G-17927B  
22 December 1981  
(See 6.6)

## MILITARY SPECIFICATION

### GASKETS, GLASS-METALLIC COVER, SILICONE CORE

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

#### 1. SCOPE

1.1 Scope. This specification covers gaskets for use on hinged closures where flame resistance is required.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

#### SPECIFICATIONS

##### FEDERAL

- PPP-B-585 - Boxes, Wood, Wirebound.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Box, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.
- PPP-B-1055 - Barrier Material, Waterproofed, Flexible.
- PPP-T-76 - Tape, Packaging, Paper (For Carton Sealing).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 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 5330

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## STANDARDS

## FEDERAL

FED-STD-313 - Material Safety Data Sheets Preparation and the Submission of.

## MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form 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 shall be the issue of the nongovernment documents which is current on the date of the solicitation.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 478 - Standard Specification for Chromium-Nickel Stainless and Heat-Resisting Steel Weaving Wire.
- D 1349 - Standard Recommended Practice for Rubber-Standard Temperatures and Atmospheres for Testing and Conditioning. (DoD adopted)
- D 2000 - Standard Classification System for Rubber Products in Automotive Applications. (DoD adopted)
- D 2240 - Standard Test Method for Rubber Property-Durometer Hardness. (DoD adopted)
- D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)
- F 205 - Standard Method for Measuring Diameter of Fine Wire by Weighing.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

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## 3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.2 Material and construction. The gaskets shall consist of a silicone core covered with two successive layers of braided wire-reinforced glass yarns or one inner layer of non-metallic reinforced glass yarn and one outer layer of wire-reinforced glass as shown in table I. The braided layers shall be adhered together, and to the silicone core with silicone rubber. The outer layer shall be covered with silicone rubber. The color of the outer layer shall be black. Asbestos material shall not be used. Gaskets shall not be lubricated with graphite or other materials.

3.2.1 Yarns.

3.2.1.1 Wire-reinforced yarns. Wire-reinforced yarns shall consist of three ends of textured continuous filament glass yarn and two ends of type 304 corrosion resistant steel (CRES) wire yarn. The wire and glass shall be plied in a manner that will secure the glass and wire and prevent skinback when tested as specified in 4.6.2.

3.2.1.2 Wire insertion. The wire shall be made of type 304 CRES in accordance with ASTM A 478. The total cross section of the two wires shall be  $0.009 \pm 0.001$  inch in diameter when tested as specified in 4.6.3. Any combination of wire diameters is permitted.

3.2.1.3 Plain yarns. Plain yarns shall consist of three ends of textured continuous filament glass yarn and two ends of synthetic yarn plied together. The synthetic yarn shall not represent more than 3 percent by weight of the plied yarn. The fibrous glass fiber diameter shall be not greater than 0.00025 inch.

3.2.2 Glass or wire-reinforced glass braids. The glass metallic braids shall be constructed from two yarns as specified in 3.2.1.1 and 3.2.1.2. The yarn shall be uniformly braided over the core. The braid shall be so constructed that there shall be a minimum of 14 two-ply yarns per inch in either direction measured at right angles to the direction of the two-ply yarn. The inner and outer braid shall be bonded together with silicone rubber, except when resiliency is affected (see 3.2.4.1). The outer braid shall be covered with silicone rubber to prevent wicking, to keep down wear, and to permit future top-dressing.

3.2.3 Silicone core. The silicone core material shall be in accordance with ASTM D 2000. The color shall be rust or black.

3.2.4 Adhesion. The silicone adhesive used between the inner and outer cover and between the inner cover and the silicone core shall give such adhesion that stripping the inner and outer glass-metallic braids from each other or from the silicone core will cause a cohesive failure when tested as specified in 4.6.5.

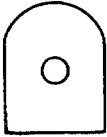



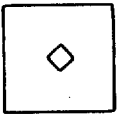

3.2.4.1 Resilience. It is permissible to omit the use of adhesives between layers when the sealing durometer of the finished gasket is  $45 \pm 5$  since the use of adhesives between layers will cause excessive loss of resilience. This paragraph only applies to shape designation 1 in table I.

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3.3 Flame and heat resistance. The finished gasket shall show no melting or loss of adhesive compound when subjected to the heat test of 4.6.6. When subjected to the flame test of 4.6.6, the gasket shall burn for not more than 60 seconds. The braided yarn covering shall hold its shape and texture when the gasket is subjected to the flame and heat tests of 4.6.6.

3.4 Dimensions, tolerances and size. Unless otherwise specified (see 6.2.1), the dimensions for the finished gasket shall be as shown in table I. The finished gasket shall be within a tolerance of plus 1/16 inch, minus 0 inch. No minus tolerance shall be permitted. The sealing durometer of the finished gasket shall be tested as specified in 4.6.7.

TABLE I. Dimensions and construction (finished gasket).

Number designation	Shape	Nominal size (inches) gasket cross-section	Sealing durometer	Construction class <sup>1/</sup>
1		3/4 x 3/4	45 $\pm$ 5	II
2		1/2 x 1-1/4	55 $\pm$ 5	I
3		1/2 x 1-1/4	55 $\pm$ 5	I
4		3/4 x 1-1/4 15/16 x 1-1/4 }	55 $\pm$ 5	I
5		1 x 1	45 $\pm$ 5	I
6		3/4 x 1-1/4	45 $\pm$ 5	I

- <sup>1/</sup> Construction class: Type I: Two successive layers of wire inserted yarn uniformly braided over core.  
 Type II: One layer of wire inserted yarn braided over one inner layer of non-wire inserted yarn uniformly braided over core.

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3.5 Length of reels. Gasket material shall be provided in 25- or 50-foot reels.

3.6 Toxic products and formulations. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency.

3.7 Material safety data sheet. The contracting activity shall be provided a material safety data sheet (MSDS) at the time of contract award. The MSDS is form OSHA-20, found in and part of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification (see 6.4).

3.8 Workmanship. The workmanship of the finished gasket shall be such as to meet all requirements of this specification. The finished gaskets shall be examined as specified in 4.5.1.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements herein are classified as follows:

- (a) First article inspection (see 4.3).
- (b) Quality conformance inspection (see 4.5).

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4.3 First article inspection. First article inspection shall consist of the examinations of 4.5 and the tests specified in 4.6. When specified in the contract or order, a test report shall be prepared (see 6.2.2).

4.4 Sampling.

4.4.1 Lot. For the purposes of sampling, examination, and tests, a lot shall consist of all gaskets of the same size, produced in one plant under essentially the same conditions, not exceeding 2500 feet and offered for delivery at one time.

4.4.2 Sampling for examination. As specified in 4.5.1, a random sample of reels shall be selected from each lot of gasket material for examination. Examination shall be in accordance with inspection level II of MIL-STD-105. The acceptable quality level (AQL) shall be 2.5 percent defective.

4.4.3 Sampling for tests. Samples of gasket material shall be selected from each lot for the test as specified in 4.5.2 at special inspection level S4 in accordance with MIL-STD-105. The AQL shall be 4.0 percent defective. Since the items are of such size and shape that all test specimens cannot be prepared from them, substitute samples of core rubber shall be furnished with each lot in the form of two sample pieces 6 by 6 inches by  $0.080 \pm 0.010$  inch thick and one sample piece approximately 4 by 3 inches by  $0.500 \pm 0.010$  inch thick, or cut from extruded core and supplied as slabs. The substitute samples shall be of the same material and equivalent core as that used in the lot of finished material offered for delivery.

4.4.3.1 Six feet of wire-reinforced yarn shall be submitted for examination (see 4.6.2).

4.5 Quality conformance inspection. The quality conformance inspection shall consist of the examination of 4.5.1 and the tests as specified in 4.6.

4.5.1 Examination. Each of the samples taken as specified in 4.4.2 shall be examined visually for workmanship, appearance, dimensions and tolerance (see table II). Any reel in the sample containing one or more visual or dimensional defects shall not be offered for delivery. If the number of defective reels in any sample exceeds the acceptance number for that sample, this shall be cause for rejection of the lot represented by the sample.

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TABLE II. Inspection points - visual.

Defects (see notes)	Classification	
	Major	Minor
Surface projections created by untrimmed braided in yarns or yarn knots on surface (a) one defect per 10 feet (b) same as above, but more than one per 10 feet	X	X
Continuity of coating on outer surface, that is, glass braid not completely covered by black silicone rubber coating (a) one uncoated area of over 1/4 square inch in area on surface per 10 feet (b) more than one uncoated area of over 1/4 square inch in area per 10 feet	X	X
Untrimmed flash: more than one projection per foot		X
Length - less than that specified - as measured when gasket is laid on a flat surface in a straight line and without introducing tension in gasket		X
Missing yarn in braid or overtight braid which creates a continuous discernable line in the surface of the rubber coating more than 6 inches in length (this causes an indentation of approximately 1/16 inch into the surface and in a helical path about the gasket forming a potential leak path for gases and liquids)	X	
Less than 14 individual yarns per inch as specified in 3.2.2 as measured below, braided into either inner or outer braided jacket when measured at 90 degrees to the direction of one selected yarn		X
Sealing hardness outside limits specified		X
Color not generally a uniform black appearance		X

## NOTES:

1. Small completely coated protrusions of individual glass fibers out of and above the coated braided surface shall not be deemed to be a defect.
2. Minor defect shall not be cause for lot rejection. Defect may be corrected at inspection.
3. Major defect shall be cause for reel rejection; however, material may be repaired and submitted for reinspection.



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4.5.2 Quality conformance tests. The samples selected for testing as specified in 4.4.3 shall be subjected to the tests as specified in 4.6. If any of the samples tested fail to meet any of the requirements specified herein, it shall be cause for rejection of the entire lot.

4.6 Test procedures.

4.6.1 Testing conditions. Unless otherwise specified, the testing conditions shall be in accordance with the temperature and humidity of conditioning room requirements in accordance with ASTM D 1349.

4.6.2 Yarn skinback (unravel) test. Approximately 16 to 18 inches of yarn (with 2 inches rolled around a mandrel and secured into a vise), shall be tested prior to weaving or plying with other yarns. Holding the loose end, the yarn shall be pinched a minimum of 1-1/2 inches from the end and the glass yarns unravelled, exposing the wires. The exposed wires shall be pinched with pliers. Holding the wires taut, the glass yarn shall be held with thumb and forefinger at least 5 inches from the end, and then made to slide back toward the vise. Yarns shall not skin back from the wire as specified in 3.2.1.1.

4.6.3 Diameter of wire. The diameter of the wire shall be tested in accordance with ASTM F 205 to determine conformance with the requirements as specified in 3.2.1.2.

4.6.4 Silicone core. The silicone core material shall be tested in accordance with ASTM D 2000.

4.6.5 Adhesion test. The inner and outer metallic cloth or braid shall be stripped from the silicone core and from each other without the use of solvents. The glass-metallic braid shall be examined after stripping apart.

4.6.6 Flame and heat resistance. A specimen of the finished gasket shall be held for 15 seconds with one face across the flame of a Tirrill-type burner. The lower side of the gasket shall be held even with the tip of the blue cone of the flame. The temperature of the flame, measured with a pyrometer, shall be approximately 1600°F at the tip of the blue cone. If a pyrometer is not available for measuring the temperature, the tip of the blue cone of the flame shall be not less than 1 inch or more than 1-1/2 inches high. The specimen, when cut open at the exposed section, shall be examined for conformance to 3.3. In addition, a specimen of the gasket shall be held over a 1600°F flame, as specified herein, for not more than 60 seconds (or until the silicone core ignites or bursts into flame). The gasket, when removed from the burner flame, shall be examined for conformance to 3.3



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4.6.7 Sealing durometer. The sealing durometer shall be determined in accordance with ASTM D 2240. The reading shall be taken on the finished gasket at the point where the knife or striker bar is to contact the gasket in actual application.

4.7 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

## 5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition.)

5.1 Preservation. Preservation shall be level A, C or commercial, as specified (see 6.2.1).

5.1.1 Level A. Reels of material shall be individually wrapped with water-proof paper in accordance with PPP-B-1055 class C-2(a) and oil seams and edges sealed with pressure sensitive water resistant tape in accordance with PPP-T-76. A minimum tape overlap of 2 inches shall be provided at all edges.

5.1.2 Level C. Reels shall be individually wrapped with an opaque wrapping paper or opaque plastic film and secured to prevent unravelling.

5.1.3 Commercial. Commercial packaging shall be in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, C or commercial, as specified (see 6.2.1).

5.2.1 Level A. Reels preserved as specified in 5.1 shall be packed in wood wirebound, wood cleated-plywood, or nailed wood boxes in accordance with PPP-B-585 class 3, PPP-B-601 overseas type, or PPP-B-621 class 2 respectively, with box selection at the option of the contractor. Gross weight of boxes shall not exceed 200 pounds. Box closures and strapping shall be as specified in the box specifications and the appendix thereto. Boxes shall be close fitting and strapping shall be zinc-coated (galvanized).

5.2.2 Level B. Reels preserved as specified in 5.1 shall be packed in fiberboard, wood wirebound, wood cleated-plywood, or nailed wood boxes in accordance with PPP-B-636 weather-resistant, PPP-B-640 weather-resistant, PPP-B-585 class 2 or 3, PPP-B-601 domestic type, or PPP-B-621 class 1 respectively, with box selection at the option of the contractor. Gross weight of wood and wood-cleated boxes shall not exceed 200 pounds; fiberboard boxes shall not exceed the weight limitations of the box specification. Box closures and strapping shall be as specified in the box specification and the appendix thereto, except that method V closures shall be in accordance with PPP-B-636 boxes.

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5.2.3 Level C. Reels preserved as specified in 5.1 shall be packed in boxes as specified in 5.2.2 except that fiberboard boxes may be of the domestic non-weather resistant class and class 1 boxes in accordance with PPP-B-585 are also acceptable. Gross weight of wood and wood-cleated boxes shall not exceed 200 pounds; fiberboard boxes shall not exceed the weight limitations of the box specification. Box closures and strapping shall be as specified in the applicable box specification and appendix thereto, except that method I closure shall be in accordance with PPP-B-636 boxes.

5.2.4 Commercial. Commercial packing shall be in accordance with ASTM D 3951.

5.3 Marking. In addition to any special marking required (see 6.2.1) interior packs and exterior shipping containers shall be marked in accordance with MIL-STD-129 for levels A, B, and C and shall include bar code marking. Commercial interior packs and shipping containers shall be marked in accordance with ASTM D 3951 and shall also include bar code marking in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. The gasket material covered by this specification is intended to be used in scuttles, doors, and hatches located in the path of missile blast areas and also in fumetight doors located in fire zone bulkheads.

### 6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) When first article inspection is required (see 3.1).
- (c) Size or dimensions required (see 3.4 and 3.5).
- (d) Testing conditions as required (see 4.6.1).
- (e) Level of packaging and packing required (see 5.1 and 5.2).
- (f) Special marking required (see 5.3).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraph.

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<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.3	First article inspection report	DI-T-4902	----

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12-L., AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 First article. When a first article inspection is required, the items should be a first article sample. The first article should consist of two units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirements for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Material safety data sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in appendix B of FED-STD-313. In order to obtain the MSDS, FAR Clause 52.223-3 must be in the contract.

6.5 Subject term (key word) listing.

Gaskets  
Glass - metallic  
Silicone core  
Yarn

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6.6 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - MR

Navy - SH

Preparing activity:

Navy - SH

(Project 5330-0660)

Review activities:

DLA - IS

Air Force - 82

DD FORM 1426  
82 MAR