

INCH-POUND

MIL-DTL-39000B
 3 October 2003
 SUPERSEDING
 MIL-F-39000A
 21 October 1977

DETAIL SPECIFICATION

 FLANGES, WAVEGUIDE, RIDGE,
 GENERAL SPECIFICATION FOR

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

This specification is inactive for new design after 8 May 1998.

1. SCOPE

1.1 Scope. This specification covers the general requirements for ridge-waveguide flanges that are used to couple mechanically and electrically two sections of ridge-waveguides or ridge-waveguide units (see 6.1).

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 cited 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).

SPECIFICATIONS

FEDERAL

- | | |
|-----------|--|
| A-A-59588 | - Rubber, Silicone. |
| FF-N-836 | - Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat. |
| FF-S-85 | - Screw, Cap, Slotted and Hexagon Head. |
| FF-S-86 | - Screw, Cap, Socket-Head. |
| FF-W-84 | - Washers, Lock (Spring). |

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAT, Post Office Box 3990, Columbus, OH 43216-5000 or emailed to TubesFiberOptic@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

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DEPARTMENT OF DEFENSE

- | | |
|---------------|---|
| MIL-F-39000/2 | - Flanges, Waveguide, Single Ridge, Socket Mount (Bandwidth Ratio 3.6:1). |
| MIL-F-39000/3 | - Flanges, Waveguide, Double Ridge, Socket Mount (Bandwidth Ratio 2.4:1). |
| MIL-F-39000/4 | - Flanges, Waveguide, Double Ridge, Socket Mount (Bandwidth Ratio 3.6:1). |

STANDARDS

DEPARTMENT OF DEFENSE

- | | |
|--------------|---|
| MIL-STD-202 | - Test Methods for Electronic and Electrical Component Parts. |
| MIL-STD-1285 | - Marking of Electrical and Electronic Parts. |

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation and Production Service, Building 4D (DPM-DoDSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

NATIONAL BUREAU OF STANDARDS (NBS)

- | | |
|--------------|--|
| Handbook H28 | - Screw-Thread Standards for Federal Services. |
|--------------|--|

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

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

ASTM INTERNATIONAL

- | | |
|------------|--|
| ASTM-B16M | - Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines (DoD adopted). |
| ASTM-B21M | - Naval Brass Rod, Bar, and Shapes (DoD adopted). |
| ASTM-B26M | - Aluminum Alloy Sand Castings (DoD adopted). |
| ASTM-B85 | - Aluminum Alloy Die Castings (DoD adopted). |
| ASTM-B108 | - Aluminum Alloy Permanent Mold Castings (DoD adopted). |
| ASTM-B124M | - Copper and Copper Alloy Forging Rod, Bar, And Shapes (DoD adopted). |
| ASTM-B140M | - Leaded Red Brass (Hardware Bronze) Rod, Bar and Shapes, Copper- Zinc-Lead (DoD adopted). |
| ASTM-B143 | - Tin Bronze and Leaded Tin Bronze Sand Castings. |
| ASTM-B221 | - Aluminum Alloy Extruded Bars, Rods, Shapes and Tubes (DoD adopted). |

(Application for copies should be addressed to the ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

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AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- | | | |
|---------------|---|---|
| ASME-B46.1 | - | Surface Texture (Surface Roughness, Waviness and Lay). |
| ASME-Y14.5.1M | - | Principles, Dimensioning and Tolerancing, Mathematical Definition of (DoD adopted). |

(Copies of these documents are available from www.asme.org or ASME Information Central Orders/Inquiries, P.O. Box 2300, Fairfield, NJ 07007-2300.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), 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 item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 Material. The material shall be as specified (see 3.1). Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.2.1 Copper alloys.

3.2.1.1 Bar stock. When fabricated from bar stock, flanges shall be of leaded red brass, naval brass, or free-cutting brass.

3.2.1.1.1 Leaded red brass. Composition of material for leaded red brass shall conform to the requirements for alloy B, half-hard, of ASTM-B140/B140M.

3.2.1.1.2 Naval brass. Naval brass shall be of the composition for alloy A or C, half-hard, of ASTM-B21/B21M.

3.2.1.1.3 Free-cutting brass. Free-cutting brass shall conform to the chemical composition requirements of ASTM-B16/B16M, half-hard.

3.2.1.2 Casting. When fabricated by casting, flanges shall be of tin bronze conforming to the composition for alloy 1A or 1B of ASTM-B143.

3.2.1.3 Forging. When fabricated by forging, flanges shall be of leaded brass conforming to composition for alloy 2 of ASTM-B124/B124M, or naval brass conforming to composition for alloy A, half-hard, of ASTM-B21/B21M, or free-cutting brass conforming to composition of ASTM-B16/B16M, half-hard.

3.2.2 Aluminum alloys.

3.2.2.1 Bar stock and forging. When fabricated from bar stock or by forging, flanges shall be of an aluminum alloy conforming to alloy 6061 of ASTM-B221. Bar stock shall be temper T6.

3.2.2.2 Sand casting. When fabricated by sand casting, flanges shall be of an aluminum alloy conforming to alloy C4A, condition T4; alloy CS43A, condition F; alloy SG70A, condition T6; or alloy ZG6LA, condition T5, of ASTM-B26/B26M.

3.2.2.3 Die casting. When fabricated by die casting, flanges shall be of an aluminum alloy conforming to the composition for alloy G8A or SG100A of ASTM-B85.

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3.2.2.4 Permanent mold casting. When fabricated by permanent mold casting, flanges shall be of an aluminum alloy conforming to alloy ZC60A, condition T5; alloy SG70A, condition T6; or alloy SC51A, condition T6, of Publication ASTM-B108.

3.2.3 Silicone rubber. When gaskets are required for use with individual types of flanges (see 3.1), the material shall be silicone rubber conforming to A-A-59588, class 2b.

3.3 Design and construction. Waveguide flanges shall be of the design, construction, and physical dimensions specified (see 3.1). Dimensions and tolerances shall be interpreted in accordance with ASME-Y14.5.1.

3.3.1 Condition. Flanges shall be annealed before finish machining, when specified (see 6.2).

3.3.2 Threaded parts. All threaded parts shall be in accordance with NBS Handbook H28.

3.3.3 Cap screws. Cap screws shall be type II, style 10P, grade 8, alloy steel, cadmium plated, in accordance with FF-S-85 or type VI, alloy steel, cadmium plated, in accordance with FF-S-86, whichever is applicable (see 3.1).

3.3.4 Hexagon nuts. Hexagon nuts shall be type II, style 4, carbon steel, cadmium plated in accordance with FF-N-836.

3.3.5 Lock washers. Lock washers shall be class A, style 2, cadmium plated in accordance with FF-W-84.

3.4 Surface roughness. When measured as specified in 4.6.2, flange surface roughness (in root mean square microinches) shall not exceed the value specified (see 3.1).

3.5 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.6 Marking. Waveguide flanges shall be marked in accordance with MIL-STD-1285, with the part number and the manufacturer's source code. The numbers shall be marked in depressed or raised characters in proportion to the size of the flange and at least 1/32 inch high, in the place specified (see 3.1).

3.7 Workmanship. Waveguide flanges shall be produced in such a manner as to be uniform in quality and all surfaces shall be free from burrs, die marks, chatter marks, scratches, dirt, grease, scale, splinters and other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the contractor.

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

- a. Materials inspection (see 4.3).
- b. Conformance inspections (see 4.5).

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table I, used in fabricating the waveguide flanges, are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

4.4 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.5 Conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection.

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4.5.1.1 Inspection lot. An inspection lot shall consist of all waveguide flanges of the same part number produced under essentially the same conditions, and offered for inspection at one time.

TABLE I. Materials inspection.

Mater a	Requ rement paragraph	App cab e spec f cat on
Copper a oys:	3 2 1	
Bar stock:	3 2 1 1	
Leaded red brass	3 2 1 1 1	ASTM-B140/B140M
Nava brass	3 2 1 1 2	ASTM-B21/B21M
Free-cut ng brass	3 2 1 1 3	ASTM-B16/B16M
Cast ng (t n bronze)	3 2 1 2	ASTM-B143
Forg ng:		
Leaded brass	3 2 1 3	ASTM-B124/B124M
Nava brass	3 2 1 3	ASTM-B21/B21M
Free-cut ng brass	3 2 1 3	ASTM-B16/B16M
Al um num a oys:	3 2 2	
Bar stock and forg ng	3 2 2 1	ASTM-B221
Sand cast ng	3 2 2 2	ASTM-B26/B26M
De cast ng	3 2 2 3	ASTM-B85
Permanent mo d cast ng	3 2 2 4	ASTM-B108
S cone rubber	3 2 3	A-A-59588

4.5.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table II, in the order shown.

TABLE II. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection	3.1, 3.3 thru 3.3.5, 3.5 and 3.6	4.6.1
Surface roughness	3.4	4.6.2

4.5.1.2.1 Sampling plan. Statistical sampling and inspection shall be performed on an inspection lot basis with a random sample of waveguide flanges selected in accordance with table III. No failures shall be allowed.

TABLE III. Group A Sampling Plan.

Lot size	Sample size
1- 13	100 percent
14- 150	13
151- 280	20
281- 500	29
501- 1,200	34
1,201- 3,200	42
3,201-10,000	50
10,001-75,000	60

4.5.1.2.2 Rejected lots. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Such lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

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4.6 Methods of inspection.

4.6.1 Visual and mechanical inspection. Waveguide flanges and associated components shall be examined to verify that the design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3 through 3.3.5, 3.6 and 3.7).

4.6.2 Surface roughness. Surface roughness shall be determined in accordance with ANSI-B46.1 (see 3.4).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or 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. Waveguide flanges covered by this specification are intended for use as coupling devices for waveguides and waveguide components used in military electronic equipment and systems.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
- c. Whether flanges are to be annealed before finish machining (see 3.3.1).
- d. Packaging requirements (see 5.1).

6.3 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. Table IV lists the Environmental Protection Agency (EPA) top seventeen hazardous materials targeted for major usage reduction. If any of these hazardous materials are required, it is recommended that it be used only when other materials cannot meet performance requirements.

TABLE IV. EPA top seventeen hazardous materials.

Benzene	Dichloromethane	Tetrachloromethylene
Cadmium and Compounds	Lead and Compounds	Toluene
Carbon Tetrachloride	Mercury and Compounds	1,1,1, - Trichloroethane
Chloroform	Methyl Ethyl Ketone	Trichloroethylene
Chromium and Compounds	Methyl Isobutyl Ketone	Xylenes
Cyanide and Compounds	Nickel and Compounds	

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6.4 Subject term (keyword) listing.

alloys
casting
coupling
forging

6.5 Part or Identifying Number (PIN). This specification requires a PIN that is as described in the appropriate reference to associated documents (see 3.1).

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

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5985-1274)

Review activities:
Army - AR, AV, MI
Navy - AS, MC, OS, SH
Air Force - 19