

METRIC

DOD-S-70328  
16 July 1982

## MILITARY SPECIFICATION

SPACER, RING, METRIC,  
GENERAL SPECIFICATION FOR

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

## 1. SCOPE

1.1 Scope. This specification covers metrically dimensioned steel ring spacers.

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation form a part of this specification to the extent specified herein.

## SPECIFICATIONS

## FEDERAL

QQ-P-416 - Plating, Cadmium (Electrodeposited)  
PPP-H-1581 - Hardware (Fasteners and Related Items), Packaging of

## MILITARY

DOD-S-70328/1 - Spacer, Ring, Metric

## STANDARDS

## FEDERAL

FED-STD-66 - Steel: Chemical Composition and Hardenability

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament Research and Development Command, ATTN: DRDAR-TST-S, Dover, NJ 07801 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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## MILITARY

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

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DODISS and the supplement thereto, if applicable.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

## ANSI B46.1 - Surface Texture

(Application for copies should be addressed to the American National Standards Institute, Incorporated, 1430 Broadway, New York, NY 10018.)

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ANSI/ASTM E 18 - Rockwell Hardness and Rockwell Superficial  
Hardness of Metallic Materials

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

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references other than specification sheets cited herein, the text of this specification shall take precedence.

## 3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 Material. Recycled and reclaimed materials shall be used to the maximum extent practicable.

3.2.1 Carbon spring steel. The spacers shall be made from carbon spring steel, composition 1070 through 1090 (UNS G10700 through UNS G10900) in accordance with FED-STD-66.

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3.3 Hardness. The spacers shall have a hardness of 41-48HRC.

3.4 Protective finish. Spacers shall be plated with electrodeposited cadmium in accordance with QQ-P-416, type II, class 2 (7.6  $\mu\text{m}$  thick).

3.5 Dimensions. Dimensions and tolerances shall be in accordance with the applicable specification sheet (see 3.1) and as specified herein and shall apply after protective finish.

3.5.1 Edges. All edges shall be broken, 0.13 mm, minimum.

3.5.2 Concentricity. The outside diameter (OD) of the spacer shall be concentric with the inside diameter (ID) within the limits specified in table I.

TABLE I. Concentricity.

Outside diameter (OD) (mm)		Concentricity ( $\mu\text{m}$ )
Over	To	
1	3	125
3	6	150
6	10	180
10	18	215
18	30	260
30	50	310
50	80	370
80	120	435

3.6 Surface roughness. Spacers shall have a maximum surface roughness of 3.2  $\mu\text{m}$ , determined in accordance with ANSI B46.1.

3.7 Cracks. Spacers shall be free from cracks, flaws and pits in any location. A crack is a clean crystalline fracture passing through or across the grain boundaries without inclusion of foreign elements.

3.8 Workmanship. Spacers shall be free from surface contamination, tool marks and other imperfections which may adversely affect useability.

#### 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 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.

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

- a. Material inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).

4.3 Material inspection. Material inspection shall consist of certification supported by verifying data that the materials used in fabricating the spacers are in accordance with 3.2.

4.4 Quality conformance inspection. Quality conformance inspection shall be as specified in table II.

TABLE II. Quality conformance inspection.

Examination or test	Requirement paragraph	Examination or test paragraph
Dimensions	3.5	4.6.1
Protective finish	3.4	4.6.2
Hardness	3.3	4.6.3

4.4.1 Inspection lot. An inspection lot shall consist of all spacers covered by a single specification sheet produced under essentially the same conditions, and offered for inspection at one time.

4.4.2 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 inspection. Resubmitted lots shall be inspected using tightened inspection. Such lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.4.3 Sampling for visual and dimensional examination. Sampling shall be in accordance with inspection level S-3 of MIL-STD-105 with an acceptable quality level (AQL) of 2.5 percent defective for major defects. For minor defects, inspection level S-3 and an AQL of 4.0 percent defective shall apply.

4.4.4 Sampling for protective finish test. Sampling for protective finish shall be in accordance with the applicable specification referenced in 3.4.

4.4.5 Sampling for hardness inspection. Sampling for hardness inspection shall be in accordance with inspection level S-1 of MIL-STD-105 with an AQL of 1.5 percent defective.

4.5 Packaging inspection. The sampling and inspection of the preservation-packaging, packing, and container marking shall be in accordance with the requirements of PPP-H-1581.

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4.6 Methods of inspection.

4.6.1 Visual and dimensional examination. Samples taken as specified in 4.4.3 shall be thoroughly examined to determine conformance with this specification and applicable specification sheet. Examination shall be conducted in accordance with table III.

TABLE III. Classification of defects.

Category	Defect	Inspection method
Critical	None defined	
Major		
101	Inside diameter, not as specified (see 3.5)	SIE <sup>1/</sup>
102	Outside diameter, not as specified (see 3.5)	SIE
103	Evidence of cracks, flaws or pits (see 3.7)	Visual
104	Thickness, not as specified (see 3.5)	SIE
Minor		
201	Protective finish missing or incomplete (see 3.4)	Visual
202	Other dimensions, not as specified (see 3.5)	SIE
203	Surface roughness, not as specified (see 3.6)	SIE
204	Workmanship (see 3.8)	Visual

<sup>1/</sup> Standard inspection equipment

4.6.1.1 Examination for evidence of cracks, flaws or pits. Samples shall be examined for evidence of cracks, flaws or pits using a 3X or 5X magnification visual aid. This examination shall be performed prior to application of protective finish.

4.6.2 Protective finish. Samples taken as specified in 4.4.4, shall be inspected for adequacy of plating in accordance with the applicable specification of 3.4.

4.6.3 Hardness. Samples taken as specified in 4.4.5 shall be tested for hardness in accordance with ASTM E 18.

## 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with PPP-H-1581 (see 6.2).

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6. NOTES

6.1 Intended use. Ring spacers acquired under this specification are intended for maintaining a predetermined distance between two surfaces.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number and date of this specification and applicable specification sheet.
- b. Applicable specification sheet (see 3.1) part number.
- c. Level (degree) of protection in accordance with PPP-H-1581, ordering data (see 5.1).

Custodians:

Army - AR  
Air Force - 99

Preparing activity:

Army - AR

(Project 5365-0052)

Review activities:

Army - AV, EA, MI  
Navy - MC  
Air Force - 11  
DLA - IS

User activities:

Army - AT, ME  
Navy - SH

Agent:

DLA - IS

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**INSTRUCTIONS** This form is provided to solicit beneficial comments which may improve this document and enhance its use. DoD contractors, government activities, manufacturers, vendors, or other prospective users of the document are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity. A response will be provided to the submitter, when name and address is provided, within 30 days indicating that the 1426 was received and when any appropriate action on it will be completed.

**NOTE:** This form shall not be used to submit requests for waivers, deviations or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

DOCUMENT IDENTIFIER (Number) AND TITLE

DOD-S-70328 SPACER, RING, METRIC, GENERAL SPECIFICATION FOR

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

VENDOR       USER       MANUFACTURER

1  HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?  IS ANY PART OF IT TOO RIGID RESTRICTIVE LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2 REMARKS

SUBMITTED BY (Printed or typed name and address - Optional)

TELEPHONE NO

DATE

DD FORM 1426  
1 OCT 76

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