INCH-POUND

MIL-C-24066B(EC)
30 June 1989
SUPERSEDING
MIL-C-24066A(EC)
18 October 1968

MILITARY SPECIFICATION

CLIP, COMPONENT, NON-ELECTRICAL,

GENERAL SPECIFICATION FOR

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 the general requirements for non-electrical component clips designed to hold miscellaneous electronic component parts.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards 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 Commander, Space and Naval Warfare Systems Command (SPAWAR 003-121), Washington, DC 20363-5100 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 5340

SPECIFICATIONS

FEDERAL

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

MILITARY

MIL-P-116 - Preservation, Methods of
MIL-C-24066/2 - Clips, Solid, Spring Tension
MIL-C-24066/3 - Clips, Single Slot, Spring Tension
MIL-C-24066/4 - Clips, Double Slot, Spring Tension

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-130 - Identification Marking of U.S. Military Property
MIL-STD-202 - Test Methods for Electronic and Electronic Component Parts

(Unless otherwise indicated, copies of federal, military specifications and standards, are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 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 which 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

ASTM B194 - Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar
ASTM A682 - Steel, Strip, High Carbon, Cold Rolled Spring Quality

(Application for copies should be addressed to the ASTM, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or 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 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 item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheets, the latter shall govern.

3.2 Material. Material shall be as specified herein. However, when a definite material is not specified, a material shall be used which will enable the component clips to meet the performance requirements of this specification. 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-beryllium alloy. Copper-beryllium alloy shall be in accordance with ASTM B194.

3.2.2 Steel, spring. Spring steel shall be in accordance with ASTM A682.

3.2.3 Finish. Unless otherwise specified in the individual specification sheet, clips shall be cadmium plated in accordance with QQ-P-416, Class 2, Type II.

3.2.4 Heat treatment. All clips shall be given a suitable heat treatment after forming for stress relief prior to cleaning and plating.

3.2.5 Recycled, virgin and reclaimed materials. There is no requirement that an item be manufactured from virgin materials.

3.3 Design and construction. The clips shall be of the design, construction and physical dimensions specified on the applicable specification sheet.

3.4 Performance.

3.4.1 Salt spray. When clips are tested as specified in 4.6.3.1, there shall be no evidence of corrosive attack of the base metal or blistering of plated surfaces.

3.4.2 Vibration. When tested as specified in 4.6.3.2, there shall be no evidence of fracture, longitudinal movement of the component under test, wear or damage to the clip. The minimum withdrawal force shall be 20 times the weight of the dummy component after the test (see 4.6.2.1).

3.4.3 Thermal shock. When tested as specified in 4.6.3.3, the clip shall retain a dummy component (see 4.6.2.1) and the extraction force shall be no less than the insertion force measured before the commencement of the test.

3.4.4 Shock. When tested as specified in 4.6.3.4, the clip will show no mechanical damage and the clip shall retain a dummy component (see 4.6.2.1) during all the shock blows as specified.

3.4.5 Life. When tested as specified in 4.6.3.5, the clip shall retain a dummy component (see 4.6.2.1) with a force not less than 70 percent of the retaining force measured before the commencement of the test. There shall be no visual indication of cracks or fractures of the clips after the test.

3.4.6 Dielectric withstanding voltage. When specified in the individual specification sheet, clips precoated with a film insulation shall be subjected to the tests as specified in 4.6.3.6. There shall be no arcing or dielectric breakdown of insulation.

3.5 Workmanship. Clips shall be manufactured and processed in a careful and workmanlike manner. Each clip shall be uniform in quality, free from burrs, slivers, gouges, porosity, cracks, or any other defects which may adversely affect the clips serviceability.

3.6 Product identification. Clips shall be legibly and durably marked in accordance with MIL-STD-130, with the manufacturer's name or symbol number.

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 (examinations and tests) 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufac-

turing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Test equipment and inspection facilities. Test equipment and inspection facilities shall be of sufficient accuracy, quality and quantity to permit performance of the required inspection. The supplier shall establish calibration of inspection equipment to the satisfaction of the Government.

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

a. Component-materials inspection (see 4.3).
b. Quality conformance inspection (see 4.5).

4.3 Component-materials inspection. Component-materials inspection shall consist of verification that the component materials listed in Table I, used in fabricating the component clips, are in accordance with the applicable referenced specifications or requirements prior to such fabrication. A certificate of analysis, furnished by the supplier may constitute verification.

TABLE I. COMPONENT-MATERIALS INSPECTION

Clip Materials	Requirement Paragraph	Applicable Specification
Cadmium plated	3.2.3	QQ-P-416
Copper-beryllium alloy	3.2.1	ASTM B194
Spring steel	3.2.2	ASTM A682

4.4 Inspection conditions. Unless otherwise specified, all inspections shall be performed at room temperature pressure, and relative humidity.

4.5 Quality conformance inspection. Quality conformance inspections shall be as specified in Table II.

TABLE II. QUALITY CONFORMANCE INSPECTION

Inspection	Requirement Paragraph	Test Paragraph
Group A		
Visual and Mechanical examination	3.1, 3.2, 3.5, 3.6	4.6.1
Inspection of preparation for delivery		4.5.3
Group B		
Thermal shock	3.4.3	4.6.3.3
Shock	3.4.4	4.6.3.4
Life	3.4.5	4.6.3.5
Vibration	3.4.2	4.6.3.2
Salt spray	3.4.1	4.6.3.1
Dielelectric withstanding voltage (when applicable)	3.4.6	4.6.3.6

4.5.1 Inspection lot. An inspection lot, as far as practicable, shall consist of all the component clips of the same type and size produced under essentially the same conditions and offered for inspection at one time.

4.5.2 Group A inspection. Group A inspection shall consist of the examinations specified in Table II.

4.5.2.1 Group A sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for ordinary inspection. The inspection level shall be S2, and the acceptable quality level (AQL) shall be 1.0 (percent defective).

4.5.2.2 Group B tests. Group B tests shall consist of the tests specified in Table II, in the order shown.

4.5.2.2.1 Group B sampling plan. Three sample units of each military part designation shall be selected from the first lot and thence from each year's production and shall be tested as specified in Table II in the order shown. No failures will be allowed. Group B tests shall be performed on sample units that have passed the group A inspection, unless the Government considers it more practical to select a separate sample from the lot for group B tests.

4.5.2.2.2 Disposition of sample units. Sample units which have been subjected to group B tests shall not be delivered on the contract or order.

4.5.3 Inspection of preparation for delivery. Sample items and packs shall be selected and in accordance with MIL-P-116 to verify conformance with requirements in section 5 of this specification.

4.6 Methods of inspection.

4.6.1 Visual and mechanical examination. Clips shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements. (See 3.2, 3.5, 3.6 and the individual specification sheet).

4.6.2 Test equipment.

4.6.2.1 Dummy component. The dummy components shall be made of aluminum with a density of 0.097 pound per cubic-inch, and a 125 micro-inch surface quality. The length of the dummy component shall be 125 percent of the length of the clip under test. The diameter shall be 1.000 $\pm$0.005 times the nominal diameter for which the clip was designed.

4.6.3 Test procedures.

4.6.3.1 Salt spray. Sample clips shall be tested in accordance with method 101, condition B of MIL-STD-202.

4.6.3.2 Vibration. Clips shall be tested in accordance with method 204 of MIL-STD-202, and with the following exceptions and details.

a. Duration of frequency sweep shall be 15 minutes.

b. The number of frequency sweeps shall be 4 along each of three mutually perpendicular axis (see 4.6.3.4(c)).

c. The amplitude shall be 0.06 total excursion or 30 G whichever is less.

d. The clips shall be rigidly mounted by their normal mounting means and with a dummy component (see 4.6.2.1) mounted in the clip. Minimum withdrawal force shall be measured (see 3.4.2).

e. Test condition B.

4.6.3.3 Thermal shock. Clips shall be tested in accordance with method 107 of MIL-STD-202, test condition C.

4.6.3.4 Shock. Clips shall be tested in accordance with method 202 of MIL-STD-202. The following details shall apply:

a. Clips shall be mounted by their normal mounting means and with a dummy component (4.6.2.1) mounted in the clip.

b. 100 G acceleration.

c. 12 blows in each of three planes.

1. Axis, perpendicular to component axis parallel to the plane to the clip base.

2. Axis, parallel to the axis of the component.

3. Axis, perpendicular to the axis of the component and to the base of the clip.

4.6.3.5 Life test. Clips shall be subjected to 100 cycles of insertion and withdrawal of a dummy component, in the direction perpendicular to the axis of the clip. The clip shall be firmly mounted with its base flat against mounting surface.

4.6.3.6 Dielectric withstanding voltage. When specified in the individual specification sheet, clips shall be tested in accordance with method 301 of MIL-STD-202. The following details and exceptions shall apply:

a. Magnitude of test voltage - As specified in the individual specification sheet.

b. Nature of potential - Alternating current.

c. Duration of application - One minute ± 5 seconds.

d. Points of applications - As specified in the individual specification sheet.

5. PACKAGING

(The preparation for delivery requirements specified herein apply only for direct Government procurements. Preparation for delivery requirements of referenced documents listed in section 2 do not apply unless specifically stated in the contract or order. Preparation for delivery requirements for products procured by contractors shall be specified in the individual order.)

5.1 Cleaning, preservation, packaging, and packing. Cleaning, preservation, packaging and packing shall conform to the requirements of PPP-H-1581, Level A, or Level C, as specified (see 6.2).

5.1.1 Unit packaging. Clips shall be individually protected and unit-packaged in accordance with MIL-P-116 for the quantities specified (see 6.2).

5.2 Marking. In addition to any special marking required by the contract or order, unit packages, intermediate packages, and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

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

6.1 Intended use. Clips, spring tension covered by this specification are intended for use in supporting cylindrical electronic components within specified temperature limitations and retention under shock and vibration.

6.2 Acquisition requirements. Acquisition documents must specify the following:

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

b. The military part number of the item.

c. Level of packaging and packing required (see 5.1).

d. Quantity of clips in each unit package (see 5.1.1).

6.3 Subject term (key word) listing.

Clip
Spring Tension Clip
Holder
Electronic Component

6.4 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.

Review Activities:
Navy - AS
DLA - IS

Preparing Activity:
Navy - EC

Agent:
DLA - IS

(Project 5340-N113)