

MIL-C-24066A(NAVY)  
18 October 1968  
~~SUPERSEDING~~  
MIL-C-24066 (SHIPS)  
26 June 1964

MILITARY SPECIFICATION  
CLIP, COMPONENT, NON-ELECTRICAL;  
GENERAL SPECIFICATION FOR

1. SCOPE

1.1 Scope. - This specification covers the general requirements for non-electrical component clips designed to hold miscellaneous electronic component parts.

1.2 Classification. -

1.2.1 Types and sizes. - The types and sizes of clips covered under this specification shall be in accordance with the applicable Military Specification sheets (see 3.1).

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

- MIL-P-116 - Preservation, Methods of.
- MIL-H-3982 - Hardware (Fasteners and Related Items) Packaging and Packing for Shipment and Storage of.

FEDERAL

- QQ-C-533 - Copper-Beryllium Alloy Strip (Copper Alloy Numbers 170 and 172).
- QQ-P-416 - Plating, Cadmium (Electrodeposited).
- QQ-S-777 - Steel, Carbon, Strip, Cold-Rolled, Untempered Spring Quality.

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 Electrical Component Parts.

See supplement 1 for list of applicable specification sheets.

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

3. REQUIREMENTS

3.1 Specification sheets. - The individual part requirements shall be as specified herein and in accordance with the applicable Military specification sheets.

3.2 Material. - Material shall be as specified herein. 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.

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3.2.1 Metals. -

3.2.1.1 Copper-beryllium alloy. - Copper-beryllium alloy shall conform to QQ-C-533.

3.2.1.2 Spring steel. - Spring steel shall be in accordance with QQ-S-777.

3.3 Design and construction. - The clips shall be of the material, design, construction and physical dimensions specified on the applicable Military Specification sheet.

3.3.1 Finish. - Unless otherwise specified in the individual specification sheet, clips shall be cadmium plated in accordance with class 2, type II of QQ-P-416.

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

3.4 Performance. - Clips shall perform satisfactorily when subjected to the tests specified in section 4.

3.4.1 Salt spray (corrosion). - 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 (insertion and withdrawal endurance). - 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 Identification marking. - Clips shall be legibly and durably marked in accordance with MIL-STD-130, with the manufacturers name or symbol number.

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

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 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 inspection. - The examination and testing of component clips shall be classified as follows:

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

4.3 Components-materials inspection. - Components-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	3.3.1	QQ-P-416
Copper-beryllium alloy	3.2.1.1	QQ-C-533
Spring steel	3.2.1.2	QQ-S-777

4.4 Inspection conditions. - Unless otherwise specified herein, all inspection shall be made at room ambient temperature, pressure, and relative humidity.

4.5 Quality conformance inspection. - Inspection of products for delivery shall consist of groups A and B.

4.5.1 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 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 levels (AQL) shall be 1.0 and 4.0 (percent defective) for major and minor defects, respectively. Major and minor defects shall be as defined in MIL-STD-105.

Table II. Group A inspection

Inspection	Requirement paragraph	Inspection paragraph
Visual and mechanical examination.	3.1, 3.2, 3.5, 3.6	4.6.1
Inspection of preparation for delivery		4.5.3

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

4.5.2.2.1 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 III 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.

Table III - Group B tests

Test	Requirement paragraph	Test paragraph
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 (corrosion)	3.4.1	4.6.3.1
Dielectric withstanding voltage (when applicable)	3.4.6	4.6.3.6

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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 examination and test. -

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 Military 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 (corrosion). - (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.

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- (c) Duration of application- One minute + 5 seconds.
- (d) Points of applications- As specified in the individual specification sheet.

#### 5. PREPARATION FOR DELIVERY

(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 MIL-H-3982, 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

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 Ordering data. - Procurement documents should 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).

Review activity:  
Navy - AS

Preparing activity  
Navy - EC  
(Project 5940-N105)