

INCH-POUND

MIL-F-411D
2 March 1990

SUPERSEDING
MIL-F-411C
7 June 1985

MILITARY SPECIFICATION

FASTENERS, BELT; CLIPS, END STRAP WITH HOOK; AND KEEPERS, SLIDE

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

1. SCOPE

1.1 Scope. This specification covers belt fasteners, strap end clip with hook, and slide keepers.

1.2 Classification. The items shall be of the following types, styles, sizes, and construction as specified (see 6.2).

Type I - Fastener, belt

Construction A - Copper alloy (brass) casting

Style 1 - 3-3/4 inch, male and female

Style 2 - 2-5/16 inch, male and female

Type II - Clip, end strap with hook

Construction A - Brass sheet and copper alloy wire

Construction B - Steel sheet and copper alloy wire

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 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 8465

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Type III - Keeper, slide

Size 1 - 1 inch

- Construction A - Brass sheet
- Construction B - Steel sheet
- Construction C - Brass sheet
- Construction D - Steel sheet

Size 2 - 2-1/4 inch

- Construction A - Brass sheet
- Construction B - Steel sheet
- Construction C - Brass sheet
- Construction D - Steel sheet
- Construction E - Steel sheet

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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

- QQ-B-613 - Brass, Leaded and Non-Leaded; Flat Products (Plate, Bar, Sheet, and Strip)
- QQ-C-390 - Copper Alloy Castings (Including Cast Bar)
- QQ-W-321 - Wire, Copper Alloy
- QQ-W-461 - Wire, Steel, Carbon, (Round, Bare, and Coated)
- TT-C-490 - Cleaning Methods for Ferrous Surfaces and Pretreatment for Organic Coatings
- TT-E-529 - Enamel, Alkyd, Semigloss
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner
- PPP-B-636 - Boxes, Shipping, Fiberboard

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- MIL-F-495 - Finish, Chemical, Black, for Copper Alloys
- MIL-B-7883 - Brazing of Steels, Copper, Copper Alloys, Nickel Alloys, Aluminum and Aluminum Alloys
- MIL-L-10547 - Liners, Case, and Sheet, Overwrap; Water-Vaporproof or Waterproof, Flexible

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STANDARDS

FEDERAL

FED-STD-595 - Colors

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

MIL-STD-129 - Marking for Shipment and Storage

MIL-STD-147 - Palletized Unit Loads

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19120-5094.)

2.1.2 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.

DRAWINGS

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

4-1-29 - Fasteners, Belt; Clips, End Strap with Hook,
and Keepers Slide

(Copies of drawings are available from the U.S. Army Natick Research, Development, and Engineering Center, ATTN: STRNC-EMSS, Natick, MA 01760-5014.)

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).

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AMERICAN IRON AND STEEL INSTITUTE (AISI)

Steel Products Manual - Wire and Rods, Carbon Steel

(Application for copies should be addressed to the American Iron and Steel Institute, 150 East Forty-Second Street, New York, NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality
- B 281 - Practice for Preparation of Copper and Copper-Base Alloys for Electroplating and Conversion Coatings
- B 633 - Electrodeposited Coatings of Zinc on Iron and Steel
- D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(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 First article. When specified, a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.2 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.2.1 Copper alloy.

3.2.1.1 Castings, copper alloy. Copper alloy (brass) castings shall conform to type I, condition as cast, alloy A3 of QQ-C-390.

3.2.1.2 Brass, sheet or strip. Brass sheet or strip shall conform to copper alloy number 268, half-hard of QQ-B-613.

3.2.1.3 Copper alloy wire. Copper alloy wire shall conform to alloy numbers 260, 270 or 274, half-hard of QQ-W-321.

3.2.2 Steel.

3.2.2.1 Steel, sheet and strip. Steel sheet and steel strip shall be cold, rolled, any temper, and of commercial quality and shall conform to ASTM A 366.

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3.2.2.2 Steel wire. Steel wire shall conform to AISI number 1015, finish 1, and annealed in process of QQ-W-461.

3.2.3 Enamel. The enamel shall conform to type I or II of TT-E-529. The color shall be semigloss black, No. 27038 of FED-STD-595.

3.3 Construction. The construction and forming of belt fasteners strap end clips with hook and slide keepers shall conform to the style and requirements as shown on Drawing 4-1-29.

3.3.1 Fasteners, belt. The type I, style 1 and 2 fasteners shall be cast of copper alloy (brass) specified in 3.2.1.1.

3.3.2 Clip, end strap with hook.

3.3.2.1 Body. The construction A body shall be stamped from 0.025-inch (22 gauge) brass sheet or strip specified in 3.2.1.2. The construction B body shall be stamped from 0.023-inch (24 gauge) steel sheet or strip specified in 3.2.2.1.

3.3.2.2 Hook. The construction A hook shall be formed of 0.028-inch (8 gauge) copper alloy wire specified in 3.2.1.3. The construction B hook shall be formed of 0.020-inch (11 gauge) diameter steel wire specified in 3.2.2.2. Hook ends shall be formed through a complete angle of 180 degrees.

3.3.3 Keeper, slide. The construction A and C keepers shall be fabricated of 0.040-inch (18 gauge) brass sheet or strip specified in 3.2.1.2. The construction B, D, and E keepers shall be fabricated of 0.035-inch (20 gauge) steel sheet or strip specified in 3.2.2.1. At the option of the manufacturer, either construction A or C may be used for brass keepers, and either construction B, D, or E, as applicable, may be used for steel keepers. Keepers shall be brazed or spot welded, as applicable.

3.4 Finish.

3.4.1 Finish preparation. Copper alloy (brass) fasteners, clips, and keepers (see 1.2) shall be cleaned as specified in ASTM B 281 prior to finish application (see 3.4.2) and those of steel (see 1.2) in accordance with method I, II, or V of TT-C-490 prior to chromate zinc coating and baked enameling (see 3.4.3).

3.4.2 Brass. The belt fasteners, brass end clips with hooks, and brass slide keepers shall be given a black chemical finish 0.00005 through 0.0002 inch thick conforming to MIL-F-495. The color shall be semigloss black, No. 27038, conforming to FED-STD-595.

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3.4.3 Steel. The steel end clips with hooks and steel slide keepers shall be given a chromate treated zinc coating conforming to type II of ASTM B 633 followed by baked enameling with the enamel specified in 3.2.3. The enamel shall dry to a smooth and uniform film free from runs, orange peel, wrinkles, or areas of no film.

3.5 Marking for identification. The belt fasteners, strap end clips with hooks, and slide keepers shall be permanently and legibly marked with the manufacturer's name or trademark of such characters as to be identifiable with the manufacturer. The marking shall be made on the back surface of the belt fasteners, strap end clips with hooks and slide keepers in such a manner that the front surface shall show no signs of penetration, unevenness, or cause distortion on any part of the belt fasteners, strap end clips with hooks, and slide keepers. All markings shall be made prior to assembly and finishing.

3.6 Workmanship.

3.6.1 Castings, copper alloy (brass). The castings shall have no porosity, blow holes, blemishes, slag, or other casting imperfections. All sharp edges and burrs shall be removed and finished smooth.

3.6.2 Stampings and forms. The stampings and forms shall be clean, smooth, and free from sharp edges, burrs, flashing, fractures, and tool marks.

3.6.3 Welds, spot. Spot welds shall be sound with the welding in accordance with good commercial practices and be free of porosity, fissures, and burned areas.

3.6.4 Brazing. Brazing shall be any one of types I through V, grade B conforming to MIL-B-7883. The brazing joints shall be sound and smooth.

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.

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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 manufacturing 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 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to assure compliance with all dimensional requirements.

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

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

4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in table I and 4.4.4. Any nonconformance or test failure shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be in accordance with MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.2 In-process inspection. The steel end clips with hook and steel slide keepers shall be examined prior to zinc plating for baked enameling as specified in 3.4.3. The Government reserves the right to exclude from consideration for acceptance, any material or service for which in-process inspection has indicated nonconformance.

4.4.3 End item visual examination. The end items shall be examined for the defects listed in table I. The lot size shall be expressed in units of belt fasteners, end clips with hooks, or slide keepers. The sample unit shall be one belt fastener, end clip with hook, or slide keeper, as applicable. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 6.5 for total (major and minor combined) defects.

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TABLE I. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Finish (general)	Not finished or finish not as specified	101	
	Evidence of corrosion		201
Black chemical	Color not as specified	102	
	Finish not clean and uniform		202
Black enamel	Area of no film or color not as specified	103	
	Separation of color or finish rough (i.e., lint, dust, dirt, or other foreign matter embedded in finish)		203
	Finish not continuous, smooth, and adherent (i.e., orange peel, wrinkles, drops, streaks)		204
Design	Components not cast or formed to the shape as specified on drawing	104	
Construction and workmanship	Not properly assembled	105	
	Any part missing	106	
	Fractured, split, bent, dented, sprung, or malformed	107	
	Burrs, flashing, or sharp edge	108	
	Holes (where required) missing in end clip with hook	109	
	Tongue of slide keeper is not formed as specified on drawing, when applicable (e.g., opening between the end of the tongue and keeper body)	110	
Spot welding and brazing	Not spot welded or brazed where required	111	
	Spot weld or braze is fractured, cracked, porous, incomplete, or not fused	112	
	Spot weld or braze is undercut	113	
	Metal is burned or damaged in welding or brazing	114	
	Weld or braze is not smooth and uniform		205
	Scale or flux deposit not removed		206

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TABLE I. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
Identification marking	Missing, incomplete, illegible, or incorrect		207
	Not on back surface of belt fasteners, end clips with hook, and slide keepers		208
	Indication of penetration or unevenness on front surface of belt fasteners, end clips with hook, and slide keepers		209
	Distortion on any part of the belt fasteners, end clips with hook, and slide keepers		210

4.4.4 End item dimensional examination. The end items shall be examined for conformance to the dimensions specified on Drawing 4-1-29. Any dimension not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of belt fasteners, end clips with hooks, or slide keepers. The sample unit shall be one belt fastener, end clip with hook, or slide keeper, as applicable. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 4.0.

4.4.5 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

<u>Examine</u>	<u>Defect</u>
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application
Materials	Any component missing, damaged, or not as specified
Workmanship	Inadequate application of components, such as incomplete sealing or closure of flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container

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<u>Examine</u>	<u>Defect</u>
Content	Number per container is more or less than required Number of belt fasteners, end clips with hooks, or slide keepers per intermediate container is more or less than specified

4.4.6 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

<u>Examine</u>	<u>Defect</u>
Finished dimensions	Length, width, or height exceeds specified maximum requirement
Palletization	Pallet pattern not as specified Interlocking of loads not as specified Load not bonded (with required straps) as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial, as specified (see 6.2).

5.1.1 Level A. Belt fasteners, end clips with hooks, or slide keepers of one type and style only shall be unit packed in the quantities specified in table II, in a snug-fitting fiberboard box conforming to style RSC, type CF, variety SW, or type SF, class domestic, grade 200 of PPP-B-636. Each box shall be agitated from time to time to ensure a compact and well-filled box. Each box shall be closed in accordance with method II as specified in the appendix of PPP-B-636.

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TABLE II. Quantity of belt fasteners, end clips with hooks, and slide keepers per unit pack and shipping container

Type, style, and and size	Quantity per unit pack	Quantity per shipping container
Type I		
Style 1	150	900
Style 2	200	1,200
Type II	500	3,000
Type III		
Size 1	1,400	8,400
Size 2	700	4,200

5.1.2 Commercial. Belt fasteners, end clips with hooks, or slide keepers shall be preserved in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, or Commercial as specified (see 6.2).

5.2.1 Level A packing. Belt fasteners, end clips with hooks, or slide keepers, preserved as specified in 5.1, shall be packed in the quantities as specified in table II in a snug-fitting fiberboard or nailed wood shipping container conforming to style FTC, grade V3s of PPP-B-636; or class 2, style 2 or 4, type 2 load of PPP-B-621, respectively. Nailed wood shipping containers shall be provided with a type I or II, grade C case liner conforming to MIL-L-10547. Fiberboard shipping containers shall be closed by taping all seams in accordance with the appendix of PPP-B-636. Reinforcing with flat strapping or tape banding shall be in accordance with the appendix of the applicable container specification.

5.2.2 Level B packing. Belt fasteners, end clips with hooks, or slide keepers, preserved as specified in 5.1, shall be packed in the quantities as specified in table II in a snug-fitting fiberboard box or nailed wood shipping container conforming to style FTC, type CF, class domestic, variety DW, grade 350 of PPP-B-636; or class 1, style 2 or 4, type 2 load of PPP-B-621, respectively. Each fiberboard shipping container shall be closed and reinforced with flat strapping or tape banding in accordance with class weather-resistant requirements in the appendix of PPP-B-636. Each nailed wood shipping container shall be closed and strapped in accordance with the appendix of PPP-B-621.

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5.2.2.1 Weather-resistant fiberboard container. When specified (see 6.2), the shipping container shall be a grade V3c, V3s, or V4s fiberboard box fabricated in accordance with PPP-B-636.

5.2.3 Commercial packing. Belt fasteners, end clips with hooks, or slide keepers, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), belt fasteners, end clips with hooks, or slide keepers, packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type I or Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV, or type V in accordance with MIL-STD-147. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be in accordance with the appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

5.4 Marking. In addition to any special marking required by the contract or purchase order, shipping containers, unit packs, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

6. NOTES

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

6.1 Intended use. The belt fasteners, strap end clips with hooks, and slide keepers are intended for use on web belts and other equipage items.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Type, style, size, and construction (see 1.2).
- c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- d. When a first article is required (see 3.1, 4.3, and 6.3).
- e. Levels of preservation and packing (see 5.1 and 5.2).
- f. Type and class of unit load (see 5.2.1).
- g. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- h. When palletization is required (see 5.3).

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6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Subject term (key word) listing.

Equipage
Hardware
Web

6.5 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 - GL
Navy - NU
Air Force - 99

Preparing activity:

Army - GL
(Project 8465-0028)

Review activities:

Army - MD
Navy - MC
Air Force - 82
DLA - CT

User activity:

Army - ME

INSTRUCTIONS. In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (DO NOT STAPLE), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

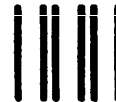
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