

MIL-B-1860E  
21 June 1977  
SUPERSEDING  
MIL-B-1860D  
13 June 1966

## MILITARY SPECIFICATION

### BUCKLE, SLIDE, PLASTIC

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

#### 1. SCOPE

1.1 Scope. This specification covers one type of plastic buckle.

1.2 Classification. The plastic buckles shall be of the following classes and sizes as specified (see 6.2):

- Class 1 - <sup>A</sup> Phenol Formaldehyde (High strength).
- Class 2 - Phenol Formaldehyde (General purpose).
- Class 3 - Melamine (General purpose).

Sizes: - 1-7/8 inches (48 mm) and 2-1/4 inches (57 mm).

#### 2. APPLICABLE DOCUMENTS

- \* 2.1 Issues of documents. 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:

Beneficial comments (recommendations, additions, deletions) and any pertinent date which may be of use in improving this document should be addressed to: US Army Natick Research and Development Command, Natick, MA 01760 by using the self-addressed Standardization Document Improvement Proposed (DD Form 1426) appearing at the end of this document or by letter.

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## SPECIFICATIONS

### FEDERAL

- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-T-45 - Tape, Gummed, Paper, Reinforced and Plain,  
for Sealing and Securing.

## STANDARDS

### FEDERAL

- FED-STD-406 - Plastics: Methods of Testing.

### MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection  
by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

## DRAWINGS

### US ARMY NATICK NATICK RESEARCH AND DEVELOPMENT COMMAND

- 4-1-147 - Buckle Impact Machine
- 4-1-187 - Buckle, Slide, Plastic; sizes 1-7/8 inch and  
2-1/4 inch.

(Miniature copies of Drawings 4-1-147 and 4-1-187 identified as figures 1 and 2, respectively, are attached for information purposes only.)

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring 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. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply:

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

### National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 1616 P Street, N.W., Washington, DC 20036.)

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UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

- \* 3.1 First article. When specified (see 6.2), the contractor shall furnish a sample for first article inspection and approval (see 4.3 and 6.5).

3.2 Material.

- \* 3.2.1 Class 1. Class 1 buckles shall be made from a phenol-formaldehyde cellulose filled molding material, such as a laminated molding board, having a minimum Izod impact strength of 0.7 foot-pounds per inch (37 J/m) of notch (see 4.4.1.1).
- \* 3.2.2 Class 2. Class 2 buckles shall be made from a phenol-formaldehyde cellulose filled molding material, having a minimum Izod impact strength of 0.46 foot-pounds per inch (25 J/m) of notch (see 4.4.1.1).
- \* 3.2.3 Class 3. Class 3 buckles shall be made from an alpha-cellulose filled melamine formaldehyde molding material having a minimum Izod impact strength of 0.25 foot-pounds per inch (13 J/m) of notch (see 4.4.1.1).

3.3 Design and construction.

3.3.1 Design. The buckles shall conform to the basic or alternate design as shown on Drawing 4-1-187.

3.3.2 Size 2-1/4 inches (57 mm). The size 2-1/4 inches (57 mm) buckles shall conform to the construction and dimensions of either the basic design or alternate design shown on Drawing 4-1-187.

3.3.3 Size 1-7/8 inches (48 mm). The size 1-7/8 inches (48 mm) buckles shall be fabricated only from class 3 material and shall conform to the construction and dimensions of either the basic design or alternate design shown on Drawing 4-1-187.

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- \* 3.3.4 Front surface and outer rim. The front surface of all buckles shall be pebbled to simulate leather and the outer rim shall be beaded to simulate stitching as shown on Drawing 4-1-187.
- \* 3.4 Finish. The finished buckles shall be free of flash and the outside surface shall be produced by molding. The application of a finish or protective coating of lacquer or other finishing materials shall not be permitted. Knockout marks are permitted on the back of the buckles provided such marks are no deeper than 0.015 inch (0.38 mm).

### 3.5 Performance.

3.5.1 Breaking strength. When tested as specified in 4.5, buckles shall have a minimum breaking strength as follows:

	Size 2-1/4 inches(57 mm)			Size 1-7/8 inches(48 mm)
	Class 1, pounds(N)	Class 2, pounds(N)	Class 3, pounds(N)	Class 3, pounds(N)
Lot sample average	170 (756)	100 (445)	75 (334)	75 (334)
Individual samples	150 (667)	90 (400)	65 (289)	65 (289)

3.5.2 Impact strength. When tested as specified in 4.5, buckles shall have the following minimum impact strength without evidence of cracking or breaking:

	Size 2-1/4 inches(57 mm)			Size 1-7/8 inches(48 mm)
	Class 1, inch-pounds	Class 2, inch-pounds	Class 3, inch-pounds	Class 3, inch-pounds
Lot sample average	10	7	7	7
Individual sample	8	5	5	5

3.5.3 Water absorption. Class 1 and class 2 buckles shall have a water absorption not greater than 1.0 percent when tested as specified in 4.5.

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3.5.4 Color fastness. Class 1 and class 2 buckles shall show no more than a slight color change when tested as specified in 4.5.

3.5.5 Color. The color of the buckles shall be as specified in the contract (see 6.2). The color of the buckles shall be uniform and shall match the standard sample (see 6.4). Unless otherwise specified, class 1 and class 2 buckles shall be furnished in dark colors only (see 6.3).

3.6 Workmanship. The finished buckles shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

#### 4. QUALITY ASSURANCE PROVISIONS

- \* 4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

- \* 4.2 Classification of inspection. 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 required (see 6.2), the preproduction samples submitted in accordance with 3.1 shall be inspected as specified in 4.4.2 for compliance with design, construction, workmanship and dimensional requirements.

4.4 Quality conformance inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated hereinafter.

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

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- \* 4.4.1.1 Certification. The contractor shall furnish a certificate of compliance stating that the material and impact strength conforms to the requirements of 3.2.1, 3.2.2 and 3.2.3, as applicable.
- \* 4.4.2 Examination of the end item. The end item shall be examined in accordance with 4.4.2.1 and 4.4.2.2. The inspection levels and acceptable quality levels (AQLs) shall be as specified in 4.4.2.3. The sample unit shall be one buckle. The lot size shall be expressed in units of one buckle of one class and size.
- \* 4.4.2.1 Visual examination of end item. Defects found during visual examination shall be classified in accordance with the list below.

<u>Examine</u>	<u>Defects</u>
Color	Not as specified. Not uniform in color or does not match standard sample. Discolored, faded or mottled. Surface haze, color segregation, or resin-streak.
Finish	Not free of flash. Evidence of protective coating of lacquer or other finishing material. Any knockout mark on front of buckle. Any knockout mark on back of buckle deeper than 0.015 inch (0.38 mm). Chalked, burned, bloom or scaly. Thin spot, wrinkle, pimple or crater. Rough surface.
Design and construction	Any design detail departing from specification or drawing requirements. Front surface of buckle not pebbled to simulate leather. Any scratch or nick affecting appearance of front of buckle. Outer rim not beaded to simulate stitching or only partially beaded. Any spot, stain or other discoloration on front of buckle affecting appearance. Any rough or sharp edge. Any crack, break, rupture or fracture. Warped, domed, dished or sinkmark. Twisted, malformed, bent out of shape or otherwise impaired. Crazing, pitted, porous, or bubble (open or closed). Heat mark, blister or uneven surface. Oil, dirt or foreign matter affecting serviceability.

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4.4.2.2 Dimensional examination. The buckle shall be examined for defects in dimensions. Any deviation in dimensions of the buckle, as specified on Drawing 4-1-187, shall be classified as a defect.

- \* 4.4.2.3 Inspection levels and acceptable quality levels (AQLs). The inspection levels and acceptable quality levels (AQLs) expressed in defects per hundred units, shall be as follows:

<u>Examination paragraph</u>	<u>Inspection level</u>	<u>AQL</u>
4.4.2.1	II	2.5
4.4.2.2	S-4	4.0

4.4.3 Packaging inspection. An examination shall be made to determine that the preservation-packaging, packing and marking comply with the section 5 requirements. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully prepared for delivery with the exception that it need not be closed. Examination of closure defects listed below shall be made on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the AQL shall be 2.5 defects per hundred units.

<u>Examine</u>	<u>Defect</u>
Marking (interior and exterior)	Omitted; incorrect; illegible; of improper size, sequence, location, or method of application.
Materials	Any component missing, damaged or not as specified.
Workmanship	Inadequate application of components, such as incomplete closure of container flaps, loose strapping, inadequate stapling, improper tapering. Bulged or distorted container.
Content	Number of buckles per interior package is more or less than required. <u>1/</u> Number of buckles per interior package is more or less than required.

1/ For this defect, one interior package from one shipping container in the sample shall be examined.

4.5 Testing of the end item. The end item shall be tested for the characteristics listed in table I. The sample unit shall be 12 buckles. The lot size shall be expressed in units of one buckle of one class and size. The sample size for the designated lot size shall be as shown below.

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All test reports shall contain the individual values utilized in expressing the final result. There shall be no failure of any sample unit to meet the requirements, as specified. For requirements applicable to the lot average, there shall be no failure to meet the requirement as specified.

<u>Lot size</u>	<u>Sample size</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE I. Testing of the end item

<u>Characteristics</u>	<u>Requirement paragraph</u>	<u>Test method</u>	<u>Requirements applicable to</u>		<u>No. determinations per sample unit</u>	<u>Results reported as numerically</u>
			<u>Sample unit</u>	<u>Lot average</u>		
Breaking strength	3.5.1	4.6.1 and 4.6.2	X	-	3	To nearest 1 pound (1 Newton)
			-	X		
Impact strength	3.5.2	4.6.1 and 4.6.3	X	-	3	To nearest 0.1 inch-pound
			-	X	3	
Water absorption (classes 1 and 2)	3.5.3	Method 7031 FED-STD-406 <u>1/</u>	-	X		To nearest 0.1 percent
Color fastness to light (classes 1 and 2)	3.5.4	Method 6031 FED-STD-406 <u>1/ 2/</u>	X	-		Color change: appreciable, or extreme

1/ Buckles shall be used in lieu of specified test specimens in referenced document.

2/ The outer surface of buckles shall face the light.

\* 4.6 Test methods.



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- \* 4.6.1 Conditioning. Breaking strength tests and impact tests may be run under room temperature conditions for preproduction and inspection tests. However, in the case of referee tests all specimens to be tested shall be conditioned at standard laboratory conditions,  $73.5 \pm 2^{\circ}\text{F}$  ( $55.6 \pm 1^{\circ}\text{C}$ ) and  $50 \pm 4$  percent relative humidity, for a minimum of 40 hours.

4.6.2 Breaking strength. Breaking strength shall be determined on a pendulum type tensile machine. The pulling grip shall have a speed at no load of  $12 \pm 1/2$  inches ( $305 \pm 13$  mm) per minute. Attachment of the buckles to the grips shall be accomplished by loops of webbing or other strap material passing around the side bars of the buckle with ends of the strips centered in the grips of the testing machine. Width of the material for size 2-1/4 inch (57 mm) buckle shall be 2 inches (51 mm) minimum and 2-3/16 inches (56 mm) maximum. For size 1-7/8 inches (48 mm) buckles material width shall be 1-5/8 inches (41 mm) minimum and 1-13/16 inches (46 mm) maximum. Distance between grips at start of test shall be 6 inches (152 mm). Specimens shall be tested to failure.

4.6.3 Impact strength. The test shall be performed with apparatus of the type shown on Drawing 4-1-147. The test buckle shall be placed front side up in the testing jig, and the jig swung into place until stopped by the clamp. In this position, the buckle shall be centered under the weight guide. The weight guide tube shall be adjusted to just graze the top of the center bar of the buckle. The test weight shall be  $1.00 \pm 0.02$  pounds and shall be made of steel. The test weight shall be released from progressively greater elevations in 1-inch increments until failure of the test specimen. The initial elevation shall be 7 inches for class 1 size 2-1/4 inch buckle; 6 inches for class 2 size 2-1/4 inch buckle; and 4 inches for class 3 size 2-1/4 inch, and class 3 size 1-7/8 inches, and shall correspond to the distance from the bottom of the weight guide tube to the bottom of the test weight. The test weight shall not be permitted to rebound on the test specimen. The test specimen shall be removed from the jig and examined after each impact for cracks and for breakage. The test shall be continued until failure (cracking or breaking).

## 5. PACKAGING

- \* 5.1 Preservation-packaging. Preservation-packaging shall be level A or C as specified (see 6.2).

- \* 5.1.1 Level A. Five hundred buckles of one class and size only, shall be packaged in a snug-fitting fiberboard box conforming to style RSC, type CF, class domestic, variety SW, grade 200 of PPP-B-636. Each box, prior to closure shall be agitated from time to time to assure a compact and well-fitted box. Box closure shall be effected with 2-inch (51 mm) minimum width gummed paper tape conforming to type III, class 2 of PPP-T-45.

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- \* 5.1.2 Level C. Buckles shall be packaged to afford adequate protection against physical damage during shipment from the contractor to the first receiving activity. The package and quantity per package shall be the same as that normally used by the contractor for retail distribution.

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

- \* 5.2.1 Level A packing. Fifteen hundred buckles of one class and size only, packaged as specified in 5.1, shall be packed in a snug-fitting fiberboard shipping container conforming to style RSC, grade V3s of PPP-B-636. Each shipping container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.3.
- \* 5.2.2 Level B packing. Fifteen hundred buckles of one class and size only, packaged as specified in 5.1, shall be packed in a snug-fitting fiberboard shipping container conforming to style RSC, type CF or SF, class domestic, variety SW, grade 275 of PPP-B-636. Each shipping container shall be closed in accordance with method II as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.3.
- \* 5.2.2.1 Weather-resistant fiberboard containers. 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 and closed in accordance with method III as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.3.
- \* 5.2.3 Level C packing. Buckles, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. The quantity per shipping container shall be the same as that normally used by the contractor for retail distribution. Containers shall comply with the Uniform Freight Classification or National Motor Freight Classification, as applicable.

5.3 Marking. In addition to any special marking required by the contract, interior boxes and shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

- 6.1 Intended use. The plastic buckle is intended for use as a component of Military clothing. The buckle is not recommended for use on garments which are subjected to baling.

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\* **6.2 Ordering data.** Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Class, size and color buckle required (see 1.2 and 3.5.5).
- (c) When a first article sample is required (see 3.1, 4.3 and 6.5).
- (d) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (e) When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).

**6.3 Color.** Phenol formaldehyde resin compositions are not considered to be light fast. Light colors have a tendency to darken, therefore, class 1 and class 2 are available in dark colors only. Class 3 is available in both light and dark colors.

\* **6.4 Standard samples for color.** For access to standard samples of the buckle for color, address the procuring office issuing the invitation for bids.

\* **6.5 First article.** When a first article is required, it shall be inspected and approved under the appropriate provisions of ASPR 7-104.55. The first article should be a preproduction sample consisting of one buckle. The contracting officer should include specific instructions in all procurement instruments, regarding arrangements for inspection and approval of the first article.

**6.6 Changes from previous issue.** The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

**Custodians:**

Army - GL  
Navy - SA  
Air Force - 99

**Preparing activity:**

Army - GL  
Project No. 8315-0111

**Review activities:**

Navy - MC  
Air Force - 11  
DLA - CT

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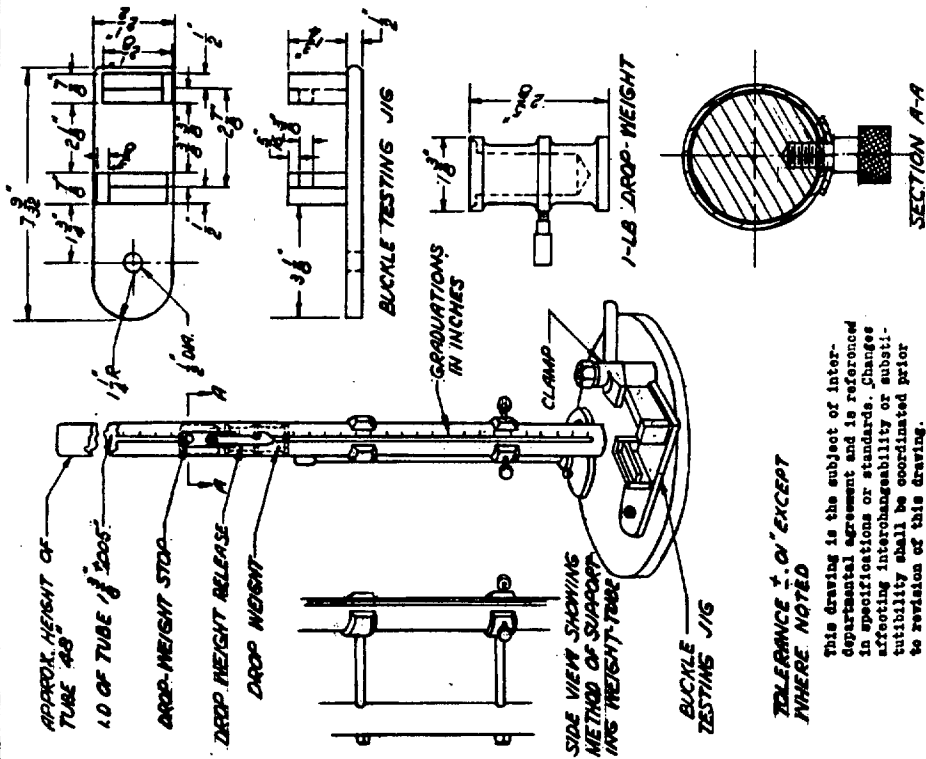


FIG. 1 THIS FIGURE IS A MINIATURE COPY OF THE ISSUE OF DRAWING 4-1-147 IN EFFECT ON THE DATE OF SPECIFICATION APPROVAL, AND IS FOR INFORMATION ONLY. THE ISSUE OF THE DRAWING REFERENCED IN THE CONTRACT SHALL GOVERN.

UNLESS OTHERWISE STATED: FABRICATING TOLERANCES ARE: DECIMALS ± .01 INCHES AND FRACTIONS ± 1/32 INCHES	APPROVED FOR THE U. S. A. <i>[Signature]</i> SPEC. NO. MIL-B-1860	DESIGNED BY BUCKLER	SCALE NONE (FOR REFERENCE ONLY)	DATE 25 SEP 56	SHEET 3 OF 3	DWG. NO. 4-1-147
BUCKLE IMPACT MACHINE						
SUPERSEDES DRAWING						
REVISIONS						
CP	REV	DATE	ADDED	INTERDEPARTMENTAL	NOTE	REV DATE
A	1	11 MAR 56				
HEADQUARTERS QUARTERMASTER RESEARCH & DEVELOPMENT COMMAND						
QUARTERMASTER RESEARCH & DEVELOPMENT CENTER, US ARMY						
NATICK, MASSACHUSETTS						

TOLERANCE ±.01" EXCEPT WHERE NOTED

This drawing is the subject of inter-departmental agreement and is referenced in specifications or standards. Changes affecting interchangeability or substitutability shall be coordinated prior to revision of this drawing.

