

MIL-S-46383B
16 September 1970
SUPERSEDING
MIL-S-46383A
1 June 1965

MILITARY SPECIFICATION

STRAP, WRIST: INSTRUMENT

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

1. SCOPE

1.1 Scope.- This specification covers the material and fabrication requirements of a woven nylon strap intended for the attachment of instruments such as watches, compasses, and depth gages to the wrist.

1.2 Classification.- Straps shall be furnished in the following types as specified.

Type I	-	Strap, Special Purpose: Non-Magnetic Buckle
Type II	-	Strap, General Purpose
Type III	-	Strap, General Purpose

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

PPP-B-636	Box, Fiberboard
PPP-T-45	Tape, Gummed, Paper, Reinforced
PPP-T-76	Tape, Pressure-Sensitive Adhesive, Paper, Water Resistant (for Carton Sealing)
PPP-T-97	Tape, Pressure-Sensitive, Adhesive, Filament Reinforced

Military

MIL-P-116	Preservation, Methods of
MIL-M-19595	Magnetic Effect Limits for Non-Magnetic Equipment Used in the Proximity of Magnetic Ordnance

FSC 6645

MIL-S-46383B

STANDARDS

Federal

FED-STD-191 Textile Test Methods

Military

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

MIL-STD-109 Quality Assurance Terms and Definitions

MIL-STD-129 Marking for Shipment and Storage

(Copies of specifications and standards 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 Preproduction sample.- Prior to production, a sample of the strap being procured shall be submitted to the contracting officer or his representative (see 6.2). The preproduction sample shall meet the requirements of this specification and shall be equal in all respects to the production units which the contractor proposes to furnish under this specification. The sample shall be manufactured utilizing the same methods, equipment and procedures as production units. Approval of the preproduction sample does not relieve the contractor of responsibility for compliance with all applicable provisions of this specification.

3.2 General.- Straps shall be furnished complete with buckle assembly.

3.3 Materials.- All materials shall be of uniform quality and free from any defects which might impair the functioning of the strap. Material which is not specified by a definite material specification shall be of a composition and quality that will enable the strap to meet all applicable requirements of this specification.

3.3.1 Yarn.- The yarn used in manufacture of the webbing, from which the strap is fabricated, shall be continuous filament, bright, high tenacity nylon. It shall be a polyamide prepared from hexamethylene diamine and adipic acid, or its derivatives, and shall have a melting point of $482^{\circ}\text{F} \pm 10^{\circ}\text{F}$. The yarn shall be 210 denier, 34 filament.

3.3.2 Ply twist.- The filling yarn shall be 2 ply and shall have a minimum of 2-1/2 turns per inch. The warp yarn shall be single ply and shall have a minimum of 2-1/2 turns per inch. The plied yarns shall be twisted together (plied) in one operation. The final ply or yarn, whether single or 2 ply, shall be twisted so as to have a minimum of 2-1/2 turns per inch of "S" twist when taken from the webbing.

3.4 Weave.- The webbing shall be composed of 2 ground warps, 1 ground warp weaving face and back, 1 ground warp weaving face to middle, 1 binder warp and 1 filling. The face and back warp shall weave plain with the picks that show on the face and back in the manner of plain tubular. The middle warp shall weave 2 up and 2 down with the face warp only. The binder warp shall weave 2 up and 2 down face to back in the manner of a double shot.

3.5 Webbing.- The nylon webbing for the Types I, II and III straps shall conform to the requirements detailed in Table I.

TABLE I

	<u>TYPES I & III</u>	<u>TYPE II</u>
Width	$3/4 \pm 1/32$	$5/8 \pm 1/32$
Thickness	$.042 \pm .005$	$.042 \pm .005$
Weight (oz/yd) min.	.360	.300
Warp ends, min. (total)	416	342
Ground, min.	258	214
Binder, min.	54	44
Face warp, min.	104	84
Picks per inch	66	66
Ply warp, min.	Singles	Singles
Ply binder, min.	Singles	Singles
Ply face warp, min.	Singles	Singles
Ply filling, min.	2	2
Breaking strength, min.	950 lbs.	800 lbs.

3.5.1 Nonfibrous materials.- Residual sizing, finishing, or other nonfibrous materials shall not exceed 2 percent of the dry weight of the webbing.

3.5.2 Acidity.- The pH value of finished webbing shall be within the range of 5 to 9.

3.6 Color.- Unless otherwise specified (see 6.2) by the procuring activity, the color of the finished webbing shall be black. The dye or dyes used shall not cause sensitization or dermatitis.

3.6.1 Colorfastness.- As specified in FED-STD-191 the dyed webbing shall show colorfastness to light, after exposure for 20 standard fading hours, and laundering equal to or better than the standard shade sample. When no standard sample is available for colorfastness the dyed webbing shall have a colorfastness rating to light of good after exposure for 20 standard fading hours and good to laundering.

3.7 Fabrication.

3.7.1 Type I strap.- The Type I strap shall be fabricated in accordance with Figure 1.

3.7.1.1 Buckle assembly.- The buckle shall be of a minimum size to accommodate the strap and shall have a tongue and pin of suitable size and shape. The buckle shall be made of brass which complies with the magnetic effect limits specified in MIL-M-19595 (see 6.1, 6.2 and 6.3.1). The buckle assembly shall have a durable nonreflecting surface and be free of burrs. The buckle shall be black oxide coated and painted with a dull black enamel finish.

3.7.2 Type II strap.- The Type II strap shall be fabricated in accordance with Figure 2.

3.7.2.1 Buckle assembly.- The buckle shall be of a minimum size to accommodate the strap and shall have a tongue and pin of suitable size and shape. The buckle assembly shall be made of stainless steel and free of sharp edges. The buckle assembly shall be finished with a nonreflecting surface. The buckle assembly shall be resistant to corrosion. The buckle shall be black oxide coated and painted with a dull black enamel finish.

3.7.3 Type III strap.- The Type III strap shall be fabricated in accordance with Figure 3.

3.7.3.1 Buckle assembly.- The buckle shall be of a minimum size to accommodate the strap and shall have a tongue and pin of suitable size and shape. The buckle assembly shall be made of stainless steel and free of sharp edges. The buckle assembly shall be finished with a nonreflecting surface. The buckle assembly shall be resistant to corrosion. The buckle shall be black oxide coated and painted with a dull black enamel finish.

3.8 Storage.- Straps shall show no evidence of damage affecting serviceability when subjected to the storage temperature of -65°F.

3.9 Low temperature flexibility.- Straps shall show no evidence of breaking or splitting after being bent rapidly through an angle of 240 degrees around a 1/2 inch diameter metal mandrel at -20°F.

3.10 High temperature-high humidity.- Straps shall show no evidence of damage affecting serviceability when subjected to 95% relative humidity at a temperature of +155°F.

3.11 Workmanship.- The finished webbing shall be clean and evenly woven. The finished strap shall be finished in conformance with the highest industry practices of workmanship, general appearance and freedom from defects. The holes on the lower side of the strap (that side of the strap nearest the wrist) shall be smooth and free from burrs.

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 in the contract or order, the supplier may use his own or 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 General provisions.- The quality assurance provisions of this specification and of other documents referenced herein form the basis for inspection to be performed by the supplier. Definitions of inspection terms not otherwise defined herein shall be as listed in MIL-STD-109.

4.2 Preproduction sample.- The contractor shall submit a preproduction sample in conformance with 3.1 for acceptance inspection (see 6.2). After approval of the sample the manufacturing processes techniques and materials used to produce the preproduction sample shall be identical to those used to produce the production strap under order or contract. Any alterations in the production manufacturing processes, techniques, materials or any contract change, determined by the contracting officer, that indicates a change in performance capability or adversely affects the reliability of the strap shall require the contractor to resubmit the strap, with changes, for new preproduction acceptance inspection. Acceptance inspection of the production strap shall cease until the new preproduction strap with changes are acceptable when inspected in accordance with the inspection provisions herein.

4.3 Lot formation.- When inspection lot sizes and lot formations are applicable, they shall be in accordance with MIL-STD-105 and shall also be defined in the contractor's inspection system.

4.3.1 Defective units and lots.- Defective units and lots shall be processed as specified in MIL-STD-105 and shall not be included as a part of the quantity specified in the contract until formal approval is obtained.

4.4 Control tests.- Five straps shall be selected at random from each 1000 produced, or, from each month's production, whichever occurs first. Control samples shall be subjected to the examinations and tests specified herein to determine compliance with 3.7, 3.8, 3.9, 3.10. The examinations and tests shall be conducted by the contractor under surveillance of the Government representative at the contractor's facility or Government approved laboratory, using test equipment authorized for use by the contract or otherwise approved by the contracting officer.

4.4.1 Control sample failure.- Should a control sample fail to meet the requirements specified in 4.4, the contractor shall cease those operations causing rejection until necessary corrections have been made by the contractor and approved by the Government. After approval of corrections and resumption of production, these requirements shall not be inspected on a control sample basis until at least ten consecutive straps produced have been inspected to the requirements specified in 4.4 and accepted by the Government.

4.5 Materials.- Certification of tests performed on the materials specified in 3.3.1, 3.3.2, 3.4, 3.5, 3.5.1, 3.5.2, 3.6, 3.6.1, 3.7.1.1, 3.7.2.1 and 3.7.3.1 shall be authenticated by a responsible company official to insure compliance with the material requirements of this specification. The information shall include identification of the materials, the specific tests performed and the results obtained. Initial test reports shall accompany the preproduction samples. Subsequent test reports shall be made upon any change in process or composition of material. Components made from material which does not comply with requirements will be rejected.

4.6 Acceptance inspection.

4.6.1 Classification of defects.- The classification of defects in Tables II and III shall constitute the contractor's minimum inspection to be performed prior to acceptance or rejection by lots on a characteristic basis.

TABLE II - CLASSIFICATION OF DEFECTS

Use Inspection Level II of Table II-A with Sampling
Plan Table IV-A of MIL-STD-105

<u>CRITICAL: AQL 0.0 Percent Defective</u>	<u>Reqt. Par.</u>	<u>QA Par.</u>	<u>Test Method</u>
1. Failure due to magnetic effect	3.7.1.1	4.7.1.1	Special Testing Equipment (STE)
<u>MAJOR: AQL 1.5 Percent Defective</u>			
101. Type I strap not fabricated in accordance with Figure 1	3.7.1	4.7.1	Standard Measuring Equipment (SME)

TABLE II - CLASSIFICATION OF DEFECTS (Cont'd)

<u>MAJOR: AQL 1.5 Percent Defective</u>	<u>Req't. Par.</u>	<u>QA Par.</u>	<u>Test Method</u>
102. Buckle assembly not complete, damaged or improperly finished	3.7.1.1	4.7.1.1	Visual
103. Type II strap not fabricated in accordance with Figure 2	3.7.2	4.7.2	SME
104. Buckle assembly not complete, damaged or improperly finished	3.7.2.1	4.7.2.1	Visual
105. Type III strap not fabricated in accordance with Figure 3	3.7.3	4.7.3	SME
106. Buckle assembly not complete, damaged or improperly finished	3.7.3.1	4.7.3.1	Visual
107. Workmanship	3.11	4.7.8	Visual
<u>MINOR: NONE DEFINED</u>			

TABLE III - CLASSIFICATION OF DEFECTS

Use Inspection Level II of Table II-A with Sampling Plan Table IV-A of MIL-STD-105

CRITICAL: NONE DEFINED

<u>MAJOR: AQL 2.5 Percent Defective</u>	<u>Req't. Par.</u>	<u>Test Method</u>
108. Straps unclean	5.1.1.1, 5.1.2	Visual
109. Straps not dry	5.1.1.2, 5.1.2	Visual
110. Incorrect method of unit packaging	5.1.1.3	Visual
111. Unit packages of different stock numbers in intermediate package	5.1.1.4	Visual
112. Packing level not as specified	5.2	Visual
113. Closure and strapping not as specified	5.2.1, 5.2.2	Visual
114. Markings illegible, incorrect, missing, not conforming to MIL-STD-129	5.5	Visual
115. Incorrect type fasteners or ink used	5.1.1.3	Certification
<u>MINOR: AQL 4.0 Percent Defective</u>		
201. Gross weight exceeded	5.4	SME
202. Container not conforming to applicable requirements	5.1.1.4, 5.2.1, 5.2.2	SME-Visual

4.7 Test methods.

4.7.1 Type I strap.- To verify conformance with the requirements of Figure 1, the strap shall be visually examined and measured, using standard measuring equipment.

4.7.1.1 Buckle assembly.- The buckle shall conform to the requirements of 3.7.1.1 and tested for magnetic effect as specified in MIL-M-19595. Unless otherwise specified (see 6.2) 100 percent of the straps shall be subjected to the magnetic test. The buckle surface shall be visually inspected to ascertain its nonreflectivity and shall be free from burrs or rough edges.

4.7.2 Type II strap.- To verify conformance with the requirements of Figure 2, the strap shall be visually examined and measured, using standard measuring equipment.

4.7.2.1 Buckle assembly.- The buckle shall conform to the requirements of 3.7.2.1 with certification as to the specified material. The buckle surface shall be visually inspected to ascertain its nonreflectivity and shall be free from burrs or rough edges.

4.7.3 Type III strap.- To verify conformance with the requirements of Figure 3, the strap shall be visually examined and measured, using standard measuring equipment.

4.7.3.1 Buckle assembly.- The buckle shall conform to the requirements of 3.7.3.1 with certification as to the specified material. The buckle surface shall be visually inspected to ascertain its nonreflectivity and shall be free from burrs or rough edges.

4.7.4 Storage test.- The straps shall be exposed to the temperature specified in 3.8 by means of a cold chest capable of maintaining that temperature for a period of 48 hours. At the end of the 48 hour period, the straps shall be removed from the test chamber and allowed to thoroughly warm up to room temperature. The straps shall then be examined and shall not be damaged in any way that would affect usage.

4.7.5 High temperature, high humidity test.- The straps shall be placed in a test chamber that is capable of maintaining the temperature and humidity requirements specified in 3.10. This exposure period shall be a minimum of 5 hours, after which the straps shall be oven dried for a minimum period of 10 hours at the high temperature of +155°F. This cycle shall be repeated three times. At the end of three such cycles the straps shall show no distortion, warpage, lateral or longitudinal shrinkage.

4.7.6 Low temperature flexibility test.- The straps shall be subjected to the temperature specified in 3.9 in a cold chamber until thermal stabilization is reached. Without removing the straps from the chamber, each strap shall be bent rapidly through a 240 degree angle around the 1/2 inch mandrel. They shall then be examined and show no evidence of breaks or splits or any other damage.

4.7.7 Heat seal test.- The heat seal of the strap and keeper shall be tested by pulling the seal apart and examining the separation. The strap shall show no evidence of the heat seal separating without removing the material. This test shall be performed with commercial equipment.

4.7.8 Workmanship.- Workmanship shall be visually examined to the requirements of 3.11. The finished strap shall be free of defects (including burrs at holes on the lower side of the strap (see 3.11) which would affect use of the strap.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging.- Preservation and packaging shall be Level A or C as specified by the procuring activity (see 6.2).

5.1.1 Level A.

5.1.1.1 Cleaning.- Each strap shall be cleaned by Process C-1 of MIL-P-116.

5.1.1.2 Drying.- Each strap shall be dried in accordance with any procedure listed in MIL-P-116 that will not damage the strap.

5.1.1.3 Unit packaging.- The straps shall be packaged Method III of MIL-P-116. The quantity of straps to be placed in the unit package shall be as specified by the procuring activity (see 6.2) and as governed by the limitations of the container. The unit container for a Type I strap shall not have magnetic type fasteners or be marked with ink containing ferrous oxide.

5.1.1.4 Intermediate packaging.- The unit packaged items to be placed in the intermediate container shall contain the same stock number. The quantity of unit packages to be placed in the intermediate container shall be as specified by the procuring activity (see 6.2). The intermediate container shall be a fiberboard box conforming to W5c of PPP-B-636. Each fiberboard box shall be closed with pressure-sensitive tape as specified in the appendix to PPP-B-636 except the tape shall conform to PPP-T-76. The intermediate package may be used as the domestic shipping container when the total quantity to be shipped to one destination is equal to or less than the specified intermediate quantity.

5.1.2 Level C.- Cleaning, drying, preservation and packaging shall be such that adequate protection is provided against corrosion, deterioration, and damage during direct shipment from the supply source to the first receiving activity for immediate use or for controlled humidity storage.

5.2 Packing.- Packing shall be specified Level A, B or C as specified by the procuring activity (see 6.2).

5.2.1 Level A.- Intermediate packages shall be packed in a fiberboard box conforming to Class 2, V3c, any style of PPP-B-636. Closure and strapping of the fiberboard box shall be as specified in the appendix to the box specification. The fiberboard shipping container shall be reinforced with filament tape conforming to Type IV of PPP-T-97. The tape shall be applied as specified in the tape specification.

5.2.2 Level B packing.- Intermediate packages shall be packed in a fiberboard box conforming to Type CF, class domestic, any style of PPP-B-636. Closure of the fiberboard box shall be as specified in the appendix to the box specification; however, the box may be closed with 3 inch tape conforming to PPP-T-45 applied to the top and bottom seams. The tape shall extend onto each end panel not less than 2-1/2 inches. If the end panel is less than 2-1/2 inches in depth, the tape shall extend the full depth of each end panel. If the bottom of the fiberboard box is closed with staples or adhesive only a single piece of tape on the top seam is required.

5.2.3 Level C packing.- Packing shall be such as to afford protection against damage during direct shipment from the supply source to the first receiving activity in a manner to insure carrier acceptance. Containers shall be in accordance with carrier rules or regulations applicable to the mode of transportation.

5.3 Size of containers.- Interior packages and exterior containers shall be of a minimum size that will provide adequate protection to the contents.

5.4 Gross weight limitation.- The gross weight of fiberboard boxes conforming to PPP-B-636 shall not exceed 70 pounds.

5.5 Marking.- In addition to any special marking required by the contract or order (see 5.1.1.3 and 6.2) interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use.- Straps are designated by types in accordance with their usage. The Type I strap is for use where resistance to magnetization is a requirement. Types II and III straps are for conventional use of items worn on the wrist.

6.2 Ordering data.- Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Quantity required.
- c. Type of strap required.
- d. If magnetic test is required (see 3.7.1.1).
- e. The quantity required for preproduction samples and the activity responsible for preproduction examination, test and approval.

- f. Selection of applicable levels of packaging and packing.
- g. Unit package quantity and intermediate package quantity.
- h. Special marking required.
- i. Color of webbing if other than black.

6.3 Caution.- Buckles specified in this specification for Type I straps shall conform to the requirements of MIL-M-19595. Variance in compositions during manufacture may produce a finished product that is unacceptable under the requirements of MIL-M-19595.

6.3.1 Applications for submitting complete straps for magnetic effect tests should be made to:

Commander, US Naval Weapons Laboratory, Code TER
Dahlgren, Virginia

The application should be made as far in advance of the anticipated submission date, as is practicable, and should contain the following information:

- a. Type of equipment
- b. Size and type of unit containers to be forwarded
- c. Quantity submitted
- d. Date of delivery
- e. Date completion is desired
- f. Reports required
- g. Disposition instructions

6.3.2 Shipments of equipment submitted for magnetic effect tests are to be addressed:

Receiving Officer
US Naval Weapons Laboratory
Dahlgren, Virginia

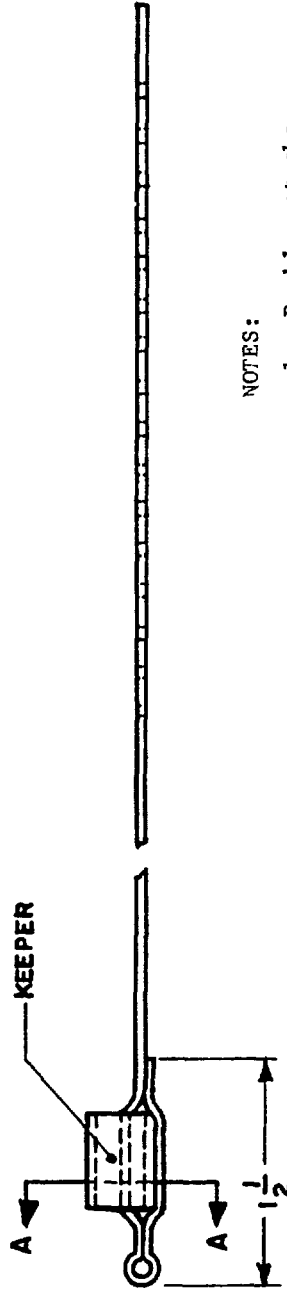
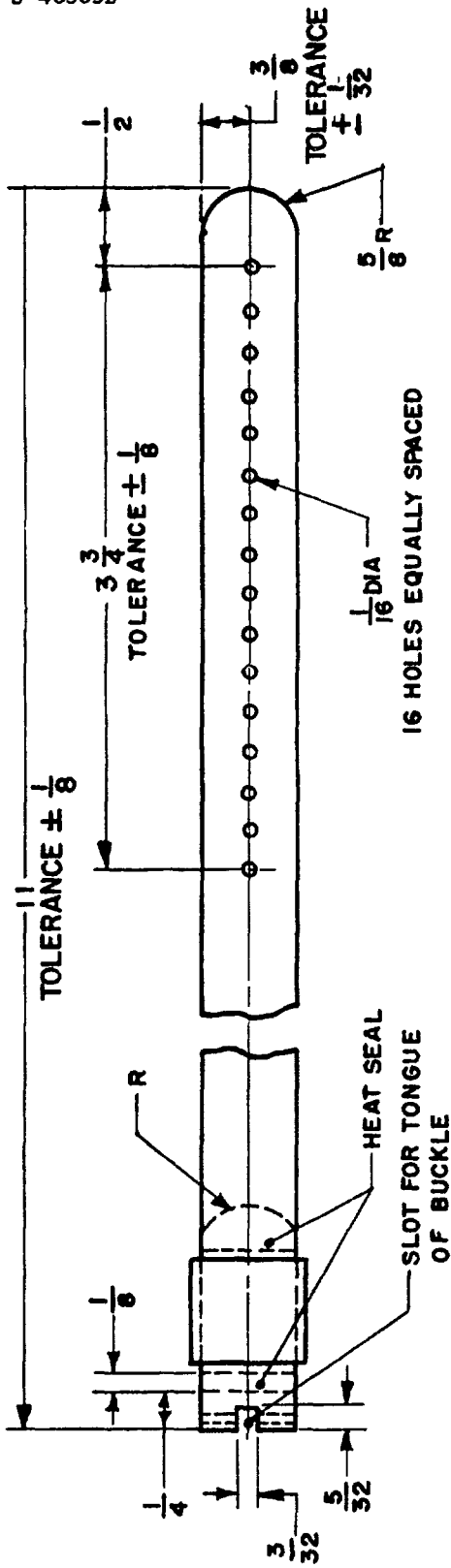
Custodians:
Army - MU
Navy - SH
Air Force - 82

Preparing activity:
Army - MU

Review activities:
Army - GL
Navy - SH
Air Force - 82

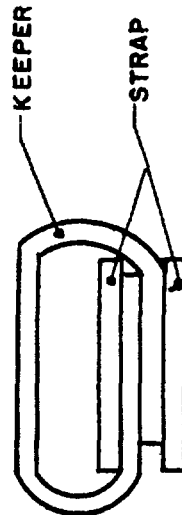
Project No. 6645-0162

User activities:
Army - ME, WC

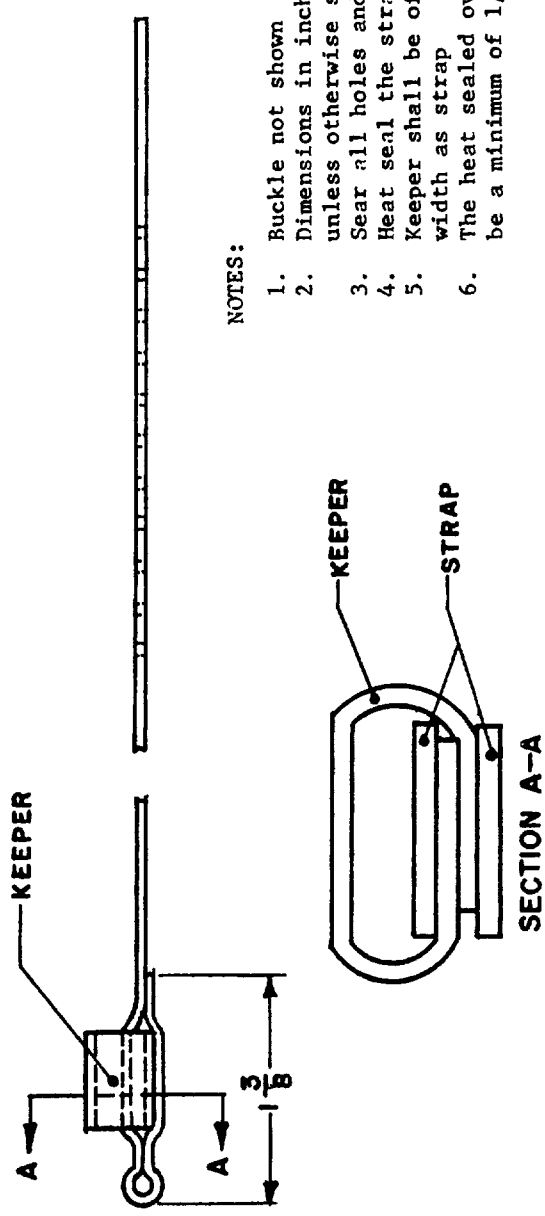
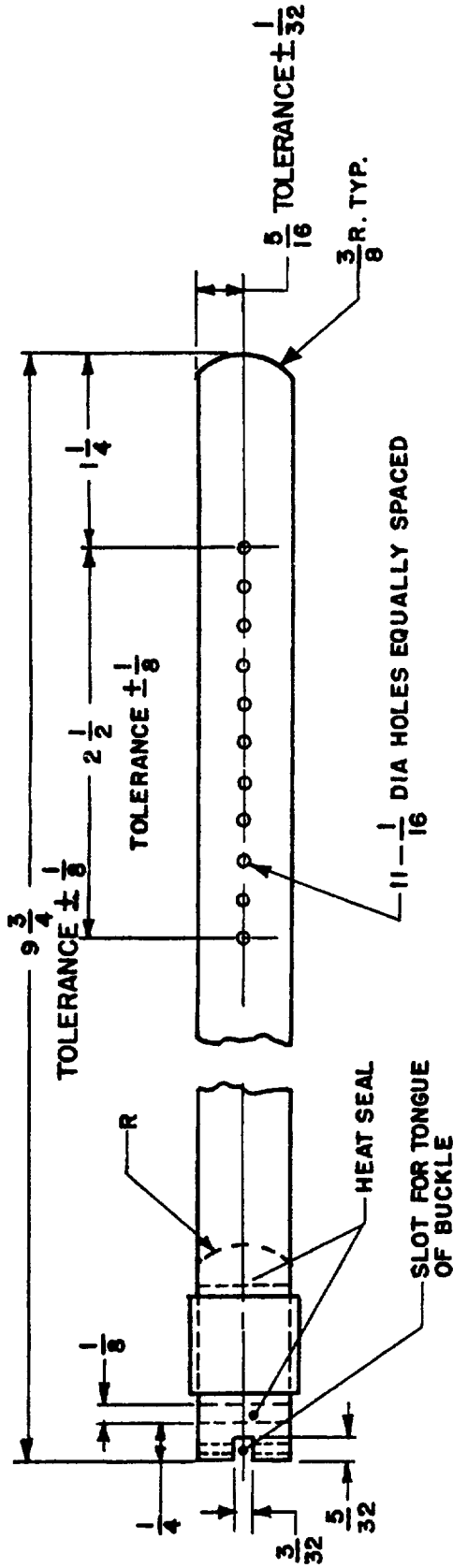


NOTES:

1. Buckle not shown
2. Dimensions in inches. Tolerance \pm 1/64 unless otherwise specified
3. Seal all holes and slot
4. Heat seal the strap and keeper
5. Keeper shall be of same material and width as strap
6. The heat sealed overlap of the keeper shall be a minimum of 1/4 inch

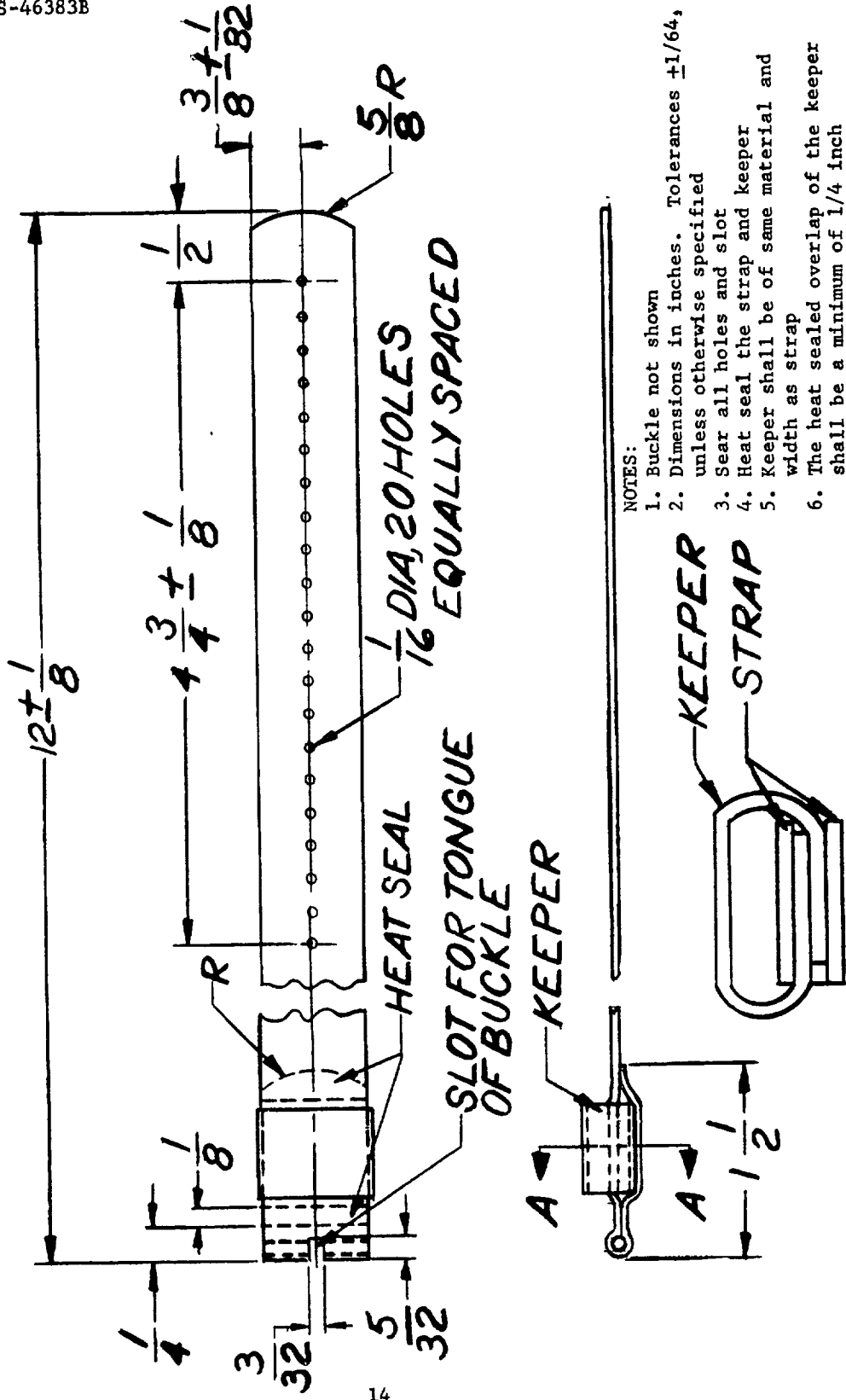


SECTION A-A
FIGURE 1--TYPE I STRAP



- NOTES:
1. Buckle not shown
 2. Dimensions in inches. Tolerances $\pm 1/64$, unless otherwise specified
 3. Seal all holes and slot
 4. Heat seal the strap and keeper
 5. Keeper shall be of same material and width as strap
 6. The heat sealed overlap of the keeper shall be a minimum of 1/4 inch

FIGURE 2 - TYPE II STRAP



NOTES:

1. Buckle not shown
2. Dimensions in inches. Tolerances $\pm 1/64$, unless otherwise specified
3. Seal all holes and slot
4. Heat seal the strap and keeper
5. Keeper shall be of same material and width as strap
6. The heat sealed overlap of the keeper shall be a minimum of $1/4$ inch

SECTION A - A FIG. 3 - TYPE III STRAP

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 22-R255

INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.

SPECIFICATION

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

DIRECT GOVERNMENT CONTRACT SUBCONTRACT

1 HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A GIVE PARAGRAPH NUMBER AND WORDING

B RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2 COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3 IS THE SPECIFICATION RESTRICTIVE?

[] YES [] NO (If "yes", in what way?)

4 REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.)

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

DATE

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED

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