

**U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE**

**SPECIFICATION FOR
CHEST HARNESS FOR FIRE SHELTER**

1. SCOPE

1.1 Scope. This specification covers the requirements for a harness to hold a fire shelter on the chest.

2. APPLICABLE DOCUMENTS

2.1 Government publications. The following government 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:

2.1.1 Federal and Military specifications and standards.

SPECIFICATIONS

FEDERAL

A-A-55301 - Webbing, Textile, Textured or Multifilament Nylon
DDD-L-20 - Label: For Clothing, Equipage, and Tentage (General Use)
V-T-295 - Thread, Nylon

MILITARY

MIL-W-4088 - Webbing, Textile, Woven Nylon
MIL-W-5664 - Webbing, Textile, Elastic
MIL-W-27265 - Webbing, Textile, Woven Nylon, Impregnated

STANDARDS

FEDERAL

FED-STD-123 - Marking for Shipment (Civil Agencies)
FED-STD-376 - Preferred Metric Units for General Use by the Federal Government

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be used in improving this document should be addressed to: USDA Forest Service, Missoula Technology and Development Center, Building 1, Fort Missoula, Missoula, MT 59804-7294 by using the Specification Comment Sheet at the end of this document or by letter.

2.1.2 Government drawings. The following form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the solicitation or agreement.

DRAWINGS

USDA FOREST SERVICE

MTDC-948 - Chest Harness, Fire Shelter

(Copies are available from USDA Forest Service, Missoula Technology and Development Center, Building 1, Fort Missoula, Missoula, MT 59804-7294.)

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 these documents are those in effect on the date of the invitation for bids or request for proposals.

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies are available from the American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 1974 - Standard Practice for Methods of Closing, Sealing, and Reinforcing
Fiberboard Shipping Containers

D 3951 - Standard Practice for Commercial Packaging

D 5118 - Standard Practice for Fabrication of Fiberboard Shipping Boxes

D 6193 - Standard Practice for Stitches and Seams

(Copies are available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Copies are available from American Trucking Associations, Inc., 2200 Mill Rd., Alexandria, VA 22314.)

(Non-Government standards and other publications normally are available from the organizations that prepare and 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 conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. Unless otherwise specified (see 6.2), samples shall be subjected to first article inspection (see 6.4) in accordance with 4.3.

3.2 Materials and components. Materials and components shall be as specified herein and in the referenced drawing, MTDC-948.

3.2.1 1 inch webbing. The 1 inch webbing shall conform to type III or type III (alternate) of A-A-55301. The color shall be black.

3.2.2 2-1/4 inch webbing. The 2-1/4-inch webbing shall conform to class VIIIc, of MIL-W-4088. The color shall be black. The webbing shall be resin impregnated conforming to class R treatment of MIL-W-27265.

3.2.3 3 inch webbing. The 3 inch webbing shall conform to type IX of MIL-W-4088. The color shall be black.

3.2.4 Thread, nylon. The thread shall conform to type II, class A of V-T-295. The color shall be black. The thread for all stitching except bartacking shall be size FF; for bartacking, the thread shall be size E.

3.2.5 Elastic keepers. The elastic keepers shall be made from elastic cotton webbing in conformance with type I, class 1 of MIL-W-5664, 1/2 inch wide, color black.

3.2.6 Plastic hardware. The plastic items specified by 3.2.6.1 through 3.2.6.3 shall be black acetal plastic. Where more than one source is listed, the mating components making up a single item shall be manufactured by the same company to ensure compatibility of the components (see 6.3).

3.2.6.1 Buckles, 1-inch. The 1-inch buckle shall conform to ITW Waterbury Side Release Buckle, part no. 101-0100; National Molding Corp. Mojave Side Squeeze Buckle, part nos. 5000/5001 (male/female); or American Cord & Webbing part no. BSR-1 inch.

3.2.6.2 Double-bar buckle. The 1-inch double-bar buckle shall conform to ITW Waterbury Trovato Ladderloc, part no. 154-0100; National Molding Corp. Tensionlocks, part no. 4199; or American Cord & Webbing Double Bar Single Lock, part no. 1" DB.

3.2.6.3 Crossover strap divider. The crossover strap divider shall be American Cord and Webbing Strap Divider (SD), 1-1/4 inch.

3.3 Construction.

3.3.1 Bartacking. The bartacking shall be $3/4 \pm 1/16$ inch in length, $1/8 \pm 1/32$ inch in width, and shall contain 42 stitches per bartack.

3.3.2 Stitching. All stitching shall conform to ASTM D 6193, type 301, 6 to 8 stitches per inch.

5100-104

3.3.2.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched not less than 1 inch (1/2 inch for box-x) except where ends are turned under or caught in other seams or stitching. Thread tension shall be maintained so there will be no loose stitching resulting in loose bobbin or top thread or excessively tight stitching resulting in puckering of the materials sewn. The lock shall be embedded in the materials sewn.

3.3.2.2 Automatic stitching. Automatic machines may be used to perform any of the stitch patterns provided the requirements for the stitch pattern, stitches per inch, and size and type of thread are met; and at least three or more tying, overlapping, or backstitches are used to secure the ends of the stitching.

3.3.2.3 Thread ends. All thread ends shall be trimmed to 1/4 inch maximum length.

3.3.2.4 Lubrication of thread. There shall be no lubrication of the thread by any means, before or during sewing.

3.3.2.5 Stitching margins. Unless otherwise specified, all stitching margins shall be 1/8 inch.

3.3.3 Fusing ends of nylon webbing. All ends of webbing shall be fused before assembly for stitching, including bias cuts of webbing. The apparatus used to fuse webbing shall provide enough heat to create a smooth edge and with the cut ends of all webbing yarns fused together.

3.3.4 Location marks. Location marks may be drilled, providing the drill diameter does not exceed 0.076 inch. All drill holes shall be covered on the finished item. Printed markings shall not exceed 1/32 inch in width.

3.3.5 Repairs. Repairs such as mends, darns, patches, or splices are not permitted.

3.3.6 Piecing. No piecing or splicing of components is allowed.

3.3.7 Replacement of defective components. During the cutting and manufacturing process, components having material defects or damages that are classified as defects in 4.3.4.1 and 4.3.4.2 shall be removed from production and replaced with nondefective and properly matched components.

3.4 Marking. The chest harness identification label shall be a sewn-on coated cloth label conforming to type VI, class 5 of DDD-L-20. The size of inscription characters shall be 1/4 -0/+1/16 inch. The label shall be located as shown on MTDC-948. The contents shall dictate label size and shall be in the following format:

CHEST HARNESS, FIRE SHELTER
[NSN]^{1/}
USFS SPEC 5100-104
[CONTRACT NO.]^{1/}
[MANUFACTURER'S NAME]^{1/}
DATE OF MANUFACTURE: [mm/yy]^{1/}

^{1/} The contractor shall insert the applicable information indicated.

3.5 Dimensions. Unless otherwise specified, all dimensions except pattern sizes are finished dimensions.

3.6 Workmanship. All items shall conform to the quality of product established by this document. The occurrence of defects shall not exceed the applicable acceptable quality levels. There shall be no defects that affect use, appearance, or serviceability.

3.7 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch/pound units, provided they fall within the tolerances specified using conversion tables contained in the latest revision of FED-STD-376, and all other requirements of this specification are met.

3.8 Recovered materials. The contractor/offeror is encouraged to use recovered materials to the maximum extent possible in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

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/her 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 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 ensure compliance with all dimensional requirements.

4.1.3 Certification of compliance. Unless otherwise specified, certificates of compliance supplied by the manufacturer of the item, component, or material, listing the specified test method and test results obtained, may be furnished in lieu of actual lot by lot testing performed by the contractor (see 4.3.2). When certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Sampling for inspections and tests. Sampling for inspections and tests shall be made in accordance with ANSI/ASQC Z1.4. The inspection level and acceptable quality level (AQL) shall be as specified. All field packs manufactured at one time shall be considered a lot for purposes of acceptance inspection and test. A sample unit shall be one complete field pack.

4.3 Quality conformance inspection. Each end item lot shall be sampled and inspected as specified in 4.3.4.1 and 4.3.4.2. The packaging shall be sampled as specified in 4.4. Unless otherwise specified (see 6.2), first articles submitted in accordance with 3.1 shall be inspected as specified in 4.3.4.1 and 4.3.4.2 except that packaging and packing is not required when first articles are presented. The presence of any defect or failure to pass any test shall be cause for rejection of the first article.

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

4.3.2 Certification. Unless otherwise specified (see 6.2), as part of first article presentations and lot inspections, it shall be acceptable for the contractor to provide certificates of compliance for all materials and components in lieu of actual lot by lot testing. In addition, when the contractor changes component or material suppliers, a new certification based on actual test results shall be required. The contractor shall also furnish a certificate of compliance for the requirement of 3.3.2.4 prohibiting use of thread lubricants before or during sewing. All certificates shall include as a minimum:

- Specification, type, class, form, etc. as applicable
- Quantity purchased
- Purchase source, address, and telephone number
- Purchase date
- Lot number traceable to materials used in production
- Contract number

4.3.3 In-process inspection. Inspection shall be made at any point or during any phase of the manufacturing process to determine whether cut lengths, cut parts, markings for location of components, and location of assembled component parts are in accordance with specified requirements. Inspection shall be made to determine that holes drilled for location marking do not exceed 0.076 inch diameter and are placed in such a manner that each shall be covered in the finished item (see 3.3.4). Whenever nonconformance is noted, corrections shall be made to the parts affected and lot in process. Components that cannot be corrected shall be removed from production.

4.3.4 End item examination.

4.3.4.1 End item visual examination. The end items shall be examined for the defects list in table I on a lot by lot basis. The lot size shall be expressed in units of complete field packs. The inspection level shall be S-3, and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 15.0 for combined major and minor defects. Unless otherwise specified, defects shall be scored on an individual basis, i.e., each stitching end, each dimension, etc.

5100-104

TABLE I. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Webbing	Size or type not as specified	X	
	Color not as specified	X	
	Any hole, cut, tear, or smash	X	
	Abrasion mark, slub, broken end or pick		X
	Cut ends not fused as specified	X	
	Treatment not as specified		X
	Not firmly and tightly woven	X	
	Edges frayed or scalloped	X	
	Multiple floats		X
Thread	Type, class, subclass, or size not as specified	X	
	Any thread lubricated		X
	Color not as specified		X
Hardware	Finish of the keeper with slide totally or partially omitted, corroded area, burr, or sharp edge	X	
	Orange peel, wrinkles, drops, streaks, thin film or no film on keeper	X	
	Any part broken, cracked, chipped, distorted, twisted or out of shape	X	
	Any dirt or flash		X
	Any deep scratch or gouge		X
	Gates not trimmed		X
	Surface not smooth		X
	Any pit, void, crazing, air pocket, blister, or imbedded foreign matter that will affect serviceability	X	
	Evidence of spray or jetting marks	X	
	Latch and latch receptacle do not mate	X	
		NOTE: Each plastic quick-release buckle shall be latched and unlatched three times to determine whether it operates smoothly and provides a secure closure.	
Seam and stitch type	Seam or stitch type not as specified	X	
Bartacks	Any bartack omitted	X	
	Any bartack not as specified or not in specified location		X
	Loose stitching, incomplete or broken		X
Stitch tension	Loose, resulting in a loose bobbin or top thread		X
	Excessively tight, resulting in puckering of material		X
(cont)	NOTE: Defects to be scored only when the condition exists for a continuous 4 inches or more, or in several areas with an accumulated distance of 8 inches or more. Applicable to individual seams.		

5100-104

TABLE I. End item visual defects (continued)

Examine	Defect	Classification	
		Major	Minor
Stitches per inch	Up to two stitches less than minimum specified		X
	Three or more stitches less than minimum specified	X	
	Two or more stitches in excess of maximum specified		X
	NOTE: Variation in the number of stitches per inch caused by the operator speeding up the machine and pulling the cloth in order to sew over heavy places or in turning corners shall be classified as follows:		
	(a) Within the minor defect classification - no defect		
	(b) Within the major defect classification - minor defect		
	Defect to be scored only when condition exists on any one seam for a length of 6 inches or more or when the combined length of several areas exceeds 10 inches.		
Stitch margin (not otherwise classified herein)	Exceeds specified tolerance, up to 1/16 inch		X
	Exceeds specified tolerance over 1/16 inch	X	
	NOTE: Defects to be scored only when the condition exists for 4 inches or more or in several areas with an accumulated distance of 8 inches or more. Applicable to individual seams.		
Stitching ends	Not secured as specified		X
Thread breaks, skipped stitches or runoffs	Not overstitched as specified		X
	NOTE: Thread breaks or two or more consecutive skipped or runoff stitches not overstitched shall be classified as open seams.		
Components and assembly	Any component part omitted or not as specified or any operation omitted or not as specified (unless otherwise classified herein)	X	
	Needle chews	X	
	Any mend, splice, or other unauthorized repair	X	
	Any material pleated or caught in stitch line where not specified		X
Male buckle and webbing (cont)	Webbing incorrectly threaded through male buckle	X	
	Male buckle upside down	X	

11/22/99

TABLE I. End item visual defects (continued)

Examine	Defect	Classification	
		Major	Minor
Piecing	Any piecing or splicing	X	
Label	Wrong type or class	X	
	Incorrect type size or information	X	
	Not in location specified	X	
	Incorrect label margins	X	

4.3.4.2 End item dimensional examination. End items shall be examined for the defects listed in table II on a lot by lot basis. Only those dimensions that can be evaluated without damaging or disassembling the end items shall be examined. The inspection level shall be S-3. An AQL, expressed in terms of defects per hundred units, shall be 6.5 major defects and 15.0 for combined major and minor defects.

TABLE II. End item dimensional defects

Examine	Defect	Classification	
		Major	Minor
Dimensions (overall)	Smaller than nominal dimensions less applicable minus tolerance indicated on drawings, but not smaller than nominal dimensions less twice the applicable minus tolerances		X
	Smaller than nominal dimensions less twice the applicable minus tolerance	X	
	Larger than nominal dimensions and applicable plus tolerance		X
Location	Not within specified tolerance		X
Box-x stitching	Dimensions not as specified		X
Stitch margin and gauge	Not within specified tolerance		X

4.4 Packaging inspection. An examination shall be made to determine that 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 packaged except that it shall not be palletized and it need not be closed. Shipping containers fully packaged that have not been palletized shall be examined for defects in closure. 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.

5100-104

<u>Examine</u>	<u>Defect</u>
Markings	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing or not as specified. Any component damaged, affecting serviceability.
Workmanship	Inadequate application of components, such as: incomplete closure of container flaps, improper taping, loose strapping, inadequate stapling.
Contents	Bulged or distorted container. Number of liners per container is more or less than required.

5. PREPARATION FOR DELIVERY

5.1 Preservation. Preservation shall be in accordance with ASTM D 3951 and as specified in the contract or purchase order.

5.2 Packaging, packing and marking.

5.2.1 Unit pack. Each harness, with buckles mated, shall be folded and secured with rubber bands or a plastic bag.

5.2.2 Packing container. Twenty (20) harnesses, packaged as specified, shall be packed in a close-fitting fiberboard box, minimum burst strength 175 psi, meeting the requirements of the latest version of ASTM D 5118. Boxes shall be in compliance with the National Motor Freight Classification. Each box shall be closed in accordance with the latest version of ASTM D 1974, except that the inspection shall be in accordance with 4.4.

5.3 Marking. In addition to any special marking required by the contract or purchase order, shipping containers and unit packs shall be marked in accordance with FED-STD-123. Bar code marking is required.

6. NOTES

6.1 Intended use. The chest harness is intended to hold the USDA Fire Shelter in an easily accessible horizontal position on the wearer's chest. It is intended for use by personnel, such as heavy equipment operators, that cannot readily wear the Fire Shelter on a belt.

6.2 Ordering data. Documents utilizing this material should specify the following:

- (a) Number of this specification.
- (b) When first article samples are not required (see 3.1, 4.3, and 6.4).
- (c) When lot by lot testing is required in lieu of certificates of compliance (see 4.3.2).
- (d) Preservation, packing, and marking required in addition to specification requirements (see section 5).

6.3 Suggested sources. The following are the sources suggested for the plastic hardware:

American Cord & Webbing Co., Inc.
1 Carrington St.
Lincoln, RI 02865

ITW Waterbury
952 South Main St.
Waterbury, CT 06721

National Molding Corp.
5 Dubon Court
Farmingdale, NY 11735-1065

6.4 First article. When first articles are required, they shall be inspected and approved under the appropriate provisions of Federal Acquisition Regulation 52.209. The first article shall consist of three completely assembled chest harnesses covered under this specification and shall be preproduction samples. The contracting officer should include specific instructions regarding arrangements for selection, inspection, and approval of the first articles.

6.5 Notice. When Government drawings, specifications or other data are used for any other purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever.

6.6 Preparing Activity. USDA Forest Service, Missoula Technology and Development Center (MTDC), Building 1, Fort Missoula, Missoula, Montana 59804-7294.

5100-104



Standardization Document Improvement Proposal

This form is provided to solicit beneficial comments that may improve this document and enhance its use. Contractors, government activities, manufacturers, vendors, and users are invited to submit comments to:

Attach any additional pertinent information that may be of use in improving this document to this form and mail in an envelope. A response will be provided when the submitter includes their name and address.

USDA Forest Service
Missoula Technology and Development Center
Building 1, Fort Missoula
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Document Identification: **5100-104 - CHEST HARNESS FOR FIRE SHELTER**

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