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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
A-A-59826 - Thread, Nylon

MILITARY

MIL-W-4088 - Webbing, Textile, Woven Nylon
MIL-W-27265 - Webbing, Textile, Woven Nylon, Impregnated
MIL-DTL-32075 – Label: For Clothing, Equipage, and Tentage (General Use)

STANDARDS

FEDERAL

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

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, 5785 Highway 10 West, Missoula, MT 59808, ddavis02@fs.fed.us.

(Unless otherwise indicated, copies of federal and military specifications and standards are available online at https://assist.daps.dla.mil/online/start/ or in hard copy from the Standardization Documents Order Desk, Building 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094. Copies of USDA Forest Service specifications are available from the preparing activity, 6.6)

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 of USDA Forest Service drawings are available from the preparing activity, see 6.6.)

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 (ASQ)

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

(Copies are available from the American Society for Quality, PO Box 3005, Milwaukee, WI 53201-3005, http://www.asq.org/.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 1974 - Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
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, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959, Website: http://www.astm.org/.).)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC. (NMFTA)

National Motor Freight Classification

(Copies are available from American Trucking Associations, Inc., National Motor Freight Traffic Association, Inc., 1001 North Fairfax Street, Suite 600, Alexandria, VA 22314, http://www.nmfta.org/)

(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), the item shall be subjected to first article inspection (see 6.4) in accordance with 4.3. During the term of the contract the contractor shall be required to notify the contracting officer in writing when a component, or the component supplier, changes in any way; when a major manufacturing process changes in any way; and when a manufacturing location changes. The contracting officer may at any time require the contractor to submit a new first article sample when substantive changes occur during the term of the contract.

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 type VIIIc, class 1, 1a, or 2, 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 A-A-59826. 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 Offray Narrow Fabrics part no. 2012 Elastic FR, Nomex 3/4 inch, color black (see 6.3).

3.2.6 Plastic hardware. The plastic items specified by 3.2.6.1 through 3.2.6.3 shall be black nylon 6/6. Mating components 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 be ITW Nexus Side Release Buckle, part no. 810-1003-299/810-1004-2099 (body/latch); National Molding Corp. Mojave Side Squeeze Buckle, part nos. 5129/5130 (male/female); or American Cord & Webbing part no. BSR-A, nylon, 1 inch.

3.2.6.2 Double-bar buckle. The 1-inch double-bar buckle shall be ITW Nexus Trovato Ladderloc, part no. 154-0100-2099; National Molding Corp. Standard Tensionlock Buckle, part no. 5060; or American Cord & Webbing Double Bar Single Lock, part no. DB Single Lock, nylon, 1 inch.

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

3.3 Construction.

3.3.1 Bartacking. The bartacking shall be 3/4 ±1/16 inch in length, 1/8 ±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.

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 nonconforming components. During the cutting and manufacturing process, components having material nonconformities or damages that are classified as nonconformities in 4.3.4.1 and 4.3.4.2 shall be removed from production and replaced with conforming 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 MIL-DTL-32075. 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 8465-01-463-4648
USFS SPEC 5100-104A
[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 nonconformities shall not exceed the applicable acceptable quality levels. There shall be no nonconformities 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 nonconforming material, either indicated or actual, nor does it commit the Government to accept nonconforming 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.

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

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 nonconformity or failure to pass any test shall be cause for non-acceptance 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 Certificates of conformance. 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 conformance (COC) for all materials and components in lieu of actual lot by lot testing. When the contractor changes component or material suppliers, a new COC shall be required. When COCs are submitted, the Government reserves the right to check test such items to determine the validity of the certification. COCs shall be provided for the following components:

1 Inch webbing (3.2.1
2-1/4 inch webbing (3.2.2)
3 inch webbing (3.2.3)
Thread (3.2.4)
Elastic keepers (3.2.5)
1 inch buckles (3.2.6.1)
Double bar buckle (3.2.6.2)
Crossover strap divider (3.2.6.3)
No thread lubricant (3.3.2.4)

4.3.2.1 COC content. For items that are specified by part number or choice of part numbers (and not "or equal"), purchasing documents showing the part number are sufficient as a COC. Otherwise the COC 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 nonconformities list in table I on a lot by lot basis. The lot size shall be expressed in units of complete chest harness. The inspection level shall be S-3, and the acceptable quality level (AQL), expressed in terms of nonconformities per hundred units, shall be 4.0 for major nonconformities and 15.0 for combined major and minor nonconformities. Unless otherwise specified, nonconformities shall be scored on an individual basis, i.e., each stitching end, each dimension, etc.

TABLE I. End item visual nonconformities

Examine	Nonconformities	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
(cont)			

TABLE I. End item visual nonconformities (continued)

Classification Examine	Nonconformity	Major	Minor
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
	NOTE: Nonconformities 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.		

(cont)

TABLE I. End item visual nonconformities (continued)

Classification Examine	Nonconformity	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 nonconformity classification - no nonconformity (b) Within the major nonconformity classification - minor nonconformity Nonconformity 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: Nonconformities 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	

TABLE I. End item visual nonconformities (continued)

Examine	Nonconformity	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 nonconformities 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 nonconformities per hundred units, shall be 6.5 major nonconformities and 15.0 for combined major and minor nonconformities.

TABLE II. End item dimensional nonconformities

Examine	Nonconformity	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. Nonconformities shall be scored in accordance with Table III. 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 nonconformities 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 nonconformities per hundred units.

Table III Packaging Examination

Examine	Nonconformity
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. Bulged or distorted container.
Contents	Number of items 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 chest harness, with buckles mated, shall be folded and secured with rubber bands or a plastic bag.

5.2.2 Packing container. Twenty (20) chest harnesses, packaged as specified, shall be packed into a 23.5"L X 12.25"W X 10.50"D fiberboard box, minimum burst strength 200 psi, (ECT 32) 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.

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 US Forest Service specification 5100-606 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) Title, number and date 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 and elastic:

American Cord & Webbing Co., Inc.
88 Century Drive
Woonsocket, RI 02895

ITW Nexus
195 Algonquin Road
Des Plains, IL 60016-6197

National Molding LLC
14427 Northwest 60th Avenue
Miami Lakes, FL 33014

Offray Narrow Fabrics
360 Route 24, P.O. Box 24
Chester, NJ 07930

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, 5785 Highway 10 West, Missoula, Montana 59808.