

**PURCHASE DESCRIPTION  
FAMILY OF IMPROVED LOAD BEARING EQUIPMENT**

This document is approved for use by all Departments and Agencies of the Department of Defense (DoD).

1. SCOPE

1.1 Description. This document covers the Family of Improved Load Bearing Equipment (FILBE) utilized by the United States Marine Corps (USMC). The load bearing equipment system is designed to allow Marines to carry equipment needed in support of combat operations. The system is modular in order to meet the unique needs of the warfighter. The load bearing equipment system shall maximize the ability to carry combat loads efficiently, minimize the burdens of weight, improve overall system compatibility and increase the combat effectiveness of the user.

1.2 Classification. The load bearing equipment shall be of the following Class:

- Class 1 – Coyote 498
- Class 2 – Woodland MARPAT
- Class 3 – Desert MARPAT
- Class 4 – Snow MARPAT
- Class 5 – OCP
- Class 6 – Tan 499

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document, which is not in reference to any active solicitations, should be addressed to Trevor Scott, trevor.h.scott.civ@mail.mil, U.S. Army Natick Research, Development and Engineering Center, Kansas Street, Natick, MA 01760.

1.3 FILBE Components. The FILBE shall consist of the following components:

- A) USMC Pack System
  - a. Main Pack
    - (1) Frame
    - (2) Shoulder Harness Assembly
    - (3) Hip Belt
    - (4) Main Bag
  - b. Assault Pack
  - c. Assault Pouch
  - d. Sustainment Pouch (Qty. 2)
  - e. Hydration Pouch (Qty. 2)
  - f. Hydration Carrier
  - g. Hydration Bladder System
    - (1) Hydration Bladder
    - (2) Hydration Tube with Cover
    - (3) Tube Holder
    - (4) Hydration Bite Valve with Cover
  - h. Sternum Cinch
  - i. Sub-Belt
  - j. Repair Kit
  - k. USMC Pack Instruction Card
- B) Chest Rig
  - a. USMC Chest Rig
- C) USMC Equipment Pouches
- D) USMC Holster
  - a. Holster Body (left or right hand)
  - b. Leg Shroud
  - c. Low-Ride Belt Mount
  - d. PALS Mount
  - e. Quick Disconnect Adapters
  - f. Use and Care Instruction
- E) Corpsman Assault System
  - a. Medical Assault Pack
  - b. Medical Sustainment Bag
  - c. Modular Medical Pouch
  - d. Medical Thigh Rig
  - e. Medical Inserts
    - (1) Narc Pouch
    - (2) Medium Pouch (Qty. 2)
    - (3) Large Pouch (Qty. 2)
    - (4) Small Reversible Pouch (Qty. 2)
    - (5) Medium Reversible Pouch (Qty. 2)
    - (6) Elastic Panel (Qty. 2)
    - (7) Double Pocket Panel
    - (8) Triple Pocket Panel

(9) Stacked Pocket Panel

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in Sections 3 and 4 of this specification. This section does not include documents cited in other sections of the specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirement documents cited in Sections 3 and 4 of this specification, whether or not they are listed. All part numbers are listed in alphabetical order by manufacturer, not by preference.

2.2 Government Drawings. The following drawings form a part of this specification to the extent specified herein.

DRAWINGS U.S. Army Natick Research, Development and Engineering Center

- 2-1-2525 - Woodland MARPAT (Coyote 476)
- 2-1-2526 - Woodland MARPAT (Green 474 with EGA symbol)
- 2-1-2527 - Woodland MARPAT (Black 477)
- 2-1-2528 - Woodland MARPAT (Khaki 475)
- 2-1-2529 - Desert MARPAT (Light Tan 479)
- 2-1-2530 - Desert MARPAT (Urban Tan 478)
- 2-1-2531 - Desert MARPAT (Light Coyote 481 with EGA symbol)
- 2-1-2532 - Desert MARPAT (Highland 480)
- 2-6-111 - GRENADE GAUGE ASSEMBLY
- 2-6-112 - GRENADE GAUGE
- 2-6-113 - STEM
- 2-6-114 - LEVER
- 2-6-101 - LADDERLOCK, ONE INCH
- 2-6-102 - SLIDE, ONE INCH
- 2-4-0101 - FASTENER, ONE INCH
- 2-1-2242 - 40 MM PYROTECHNIC GRENADE GAUGE
- 2-1-2243 - 40 MM HIGH EXPLOSIVE GRENADE GAUGE
- 2-6-110 - M16 30 ROUND MAGAZINE GAUGE
- 2-4-0102 - MOLDED LOCKING CARIBINER
- 2-6-329 - MOLLE POCKET ATTACHMENT

2.3 Chest Rig Drawings. The following drawings form a part of this specification to the extent specified herein.

DRAWINGS U.S. Army Natick Research, Development and Engineering Center

- 2-6-0801 - MARINES, CHEST RIG, ASSEMBLY
- 2-6-0792 - ATTACHING STRAP, ASSEMBLY (MARINES)

- 2-6-0852 - IMTV/PC ATTACHING STRAP, ASSEMBLY
- 2-6-0794 - HARNESS ASSEMBLY (TAP)
- 2-3-0632 - SINGLE BAR SIDE RELEASE FASTENER, 1 INCH
- 2-6-0798 - QUICK ATTACH, BUCKLE 1 INCH
- 2-6-0799 - SINGLE, BAR SIDE RELEASE BUCKLE, 1 INCH
- 2-6-234 - IDENTIFICATION/INSTRUCTION, LABELS MOLLE II

2.4 Pouch Drawings. The following drawings form a part of this specification to the extent specified herein.

DRAWINGS U.S. Army Natick Research, Development and Engineering Center

- 2-6-0761 - GROUND ILLUMINATION FLARE SINGLE POUCH ASSEMBLY
- 2-6-0762 - PATTERNS, ILLUMINATION FLARE SINGLE
- 2-6-0763 - SHOTGUN SHELL AMMUNITION POUCH ASSY, 12 GA., 10 ROUND
- 2-6-0764 - PATTERNS, SHOTGUN AMMUNITION POUCH
- 2-6-0765 - UTILITY/SQUAD AUTOMATIC WEAPON (SAW) AMMO. POUCH ASSEMBLY WITH DIVIDER
- 2-6-0766 - PATTERNS, UTILITY/SQUAD AUTOMATIC WEAPON POUCH
- 2-6-0767 - SMOKE GRENADE POUCH ASSEMBLY
- 2-6-0768 - PATTERNS, SMOKE GRENADE FBP POUCH
- 2-6-0769 - M67 GRENADE POUCH ASSEMBLY
- 2-6-0770 - PATTERNS, M67 GRENADE POUCH
- 2-6-0773 - MAGAZINE DUMP POUCH ASSEMBLY
- 2-6-0774 - PATTERNS, MAGAZINE DUMP POUCH
- 2-6-0775 - 9MM, 15 ROUND, MAGAZINE POUCH ASSEMBLY
- 2-6-0776 - PATTERNS, 9MM, 15 ROUNDS, MAGAZINE POUCH
- 2-6-0777 - M16/M4 SPEED RELOAD POUCH ASSEMBLY
- 2-6-0778 - PATTERNS, M16/M4 SPEED RELOAD POUCH
- 2-6-0779 - 40MM GRENADE POUCH ASSEMBLY
- 2-6-0780 - PATTERNS, 40MM GRENADE POUCH
- 2-6-0781 - M16/M4 DOUBLE/SINGLE MAGAZINE POUCH ASSEMBLY
- 2-6-0782 - PATTERNS, M16/M4 DOUBLE/SINGLE MAGAZINE POUCH

2.5 USMC Pack Drawings. The following USMC Pack drawings form a part of this specification to the extent specified herein.

DRAWINGS U.S. Army Natick Research, Development and Engineering Center

- 2-6-0805 - FRAME, USMC PACK
- 2-6-0887 - HYDRATION POUCH ASSEMBLY, USMC PACK
- 2-6-0889 - ASSAULT POUCH ASSEMBLY, USMC PACK
- 2-6-0890 - HIP BELT ASSEMBLY, USMC PACK
- 2-6-0891 - SUSTAINMENT POUCH ASSEMBLY, USMC PACK
- 2-6-0892 - ASSAULT PACK ASSEMBLY, USMC PACK
- 2-6-0893 - HYDRATION CARRIER ASSEMBLY, USMC PACK

- 2-6-0894 - USMC MAIN PACK ASSEMBLY
- 2-6-0896 - SHOULDER HARNESS ASSEMBLY, USMC PACK
- 2-6-0897 - FRONT POCKET ASSEMBLY, ASSAULT PACK
- 2-6-0898 - SHOULDER HARNESS ASSEMBLY, ASSAULT PACK
- 2-6-0902 - SHOULDER HARNESS POCKET ASSY, ASSAULT PACK
- 2-6-0903 - LID, USMC MAIN PACK ASSEMBLY
- 2-6-0904 - IDENTIFICATION & INSTRUCTION LABEL
- 2-6-0905 - HANDLE ASSEMBLY, ASSAULT PACK
- 2-6-0906 - SHOULDER HARNESS, USMC PACK
- 2-6-0907 - BLADDER, HYDRATION SYSTEM, USMC PACK
- 2-6-0908 - FRONT POCKET, HYDRATION CARRIER, USMC PACK
- 2-6-0920 - PATTERNS, HYDRATION CARRIER
- 2-6-0921 - PATTERNS, HYDRATION POUCH
- 2-6-0922 - PATTERNS, ASSAULT POUCH
- 2-6-0923 - PATTERNS, HIP BELT
- 2-6-0924 - PATTERNS, SUSTAINMENT POUCH
- 2-6-0925 - PATTERNS, MAIN BAG
- 2-6-0926 - PATTERNS, ASSAULT PACK
- 2-6-0927 - PATTERNS, SHOULDER HARNESS

2.5.1 Corpsman Assault System Drawings. The following Corpsman Assault System (CAS) drawings form a part of this specification to the extent specified herein.

DRAWINGS U.S. Army Natick Research, Development and Engineering Center

- 2-6-0930 - STACKED POCKET PANEL, CAS
- 2-6-0931 - MEDICAL SUSTAINMENT BAG, CAS
- 2-6-0932 - DOUBLE POCKET PANEL, CAS
- 2-6-0933 - TRIPLE POCKET PANEL, CAS
- 2-6-0934 - NARC POUCH, CAS
- 2-6-0935 - ELASTIC PANEL, CAS
- 2-6-0936 - SMALL REVERSIBLE POUCH, CAS
- 2-6-0937 - MEDIUM REVERSIBLE POUCH, CAS
- 2-6-0938 - MEDIUM POUCH, CAS
- 2-6-0939 - LARGE POUCH, CAS
- 2-6-0940 - MEDICAL ASSAULT PACK, CAS
- 2-6-0941 - SHOULDER HARNESS ASSEMBLY, CAS
- 2-6-0942 - SHOUDLER HARNESS POCKET ASSEMBLY, CAS
- 2-6-0943 - HANDLE ASSEMBLY, CAS
- 2-6-0944 - CORPSMAN ASSAULT SYSTEM
- 2-6-0945 - MEDICAL THIGH RIG, CAS
- 2-6-0946 - BELT, MEDICAL THIGH RIG, CAS
- 2-6-0947 - STRAP, UPRIGHT, MEDICAL THIGH RIG, CAS
- 2-6-0948 - STRAP, MEDICAL THIGH RIG, CAS
- 2-6-0949 - MODULAR MEDICAL POUCH, CAS
- 2-6-0950 - PATTERNS, MEDICAL ASSAULT PACK, CAS

- 2-6-0951 - PATTERNS, MEDICAL SUSTAINMENT BAG, CAS
- 2-6-0952 - PATTERNS, MEDICAL THIGH RIG, CAS
- 2-6-0953 - PATTERNS, MODULAR MEDICAL POUCH, CAS
- 2-6-0954 - PATTERNS, NARC POUCH, CAS
- 2-6-0955 - PATTERNS, MEDIUM POUCH, CAS
- 2-6-0956 - PATTERNS, LARGE POUCH, CAS
- 2-6-0957 - PATTERNS, SMALL REVERSIBLE POUCH, CAS
- 2-6-0958 - PATTERNS, MEDIUM REVERSIBLE POUCH, CAS
- 2-6-0959 - PATTERNS, ELASTIC PANEL, CAS
- 2-6-0960 - PATTERNS, DOUBLE POCKET PANEL, CAS
- 2-6-0961 - PATTERNS, TRIPLE POCKET PANEL, CAS
- 2-6-0962 - PATTERNS, STACKED POCKET PANEL, CAS
- 2-6-0963 - IDENTIFICATION & INSTRUCTION LABEL

(Copies of specifications, standards and drawings required by contractors in connection with specification procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer).

2.6 Non-Government Publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are Department of Defense Index of Specifications and Standards (DoDISS) adopted, are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DoDISS are the issues of the documents cited in the solicitation.

#### AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

- AATCC METHOD 8-1989 - Colorfastness to Crocking: AATCC Crockmeter Method
- AATCC METHOD 16-1993 - Colorfastness to Light
- AATCC METHOD 22-1989 - Water Repellency: Spray Test
- AATCC METHOD 61-1994 - Colorfastness to Laundering, Home and Commercial:  
Accelerated
- AATCC METHOD 70-1994 - Water Repellency: Tumble Jar Dynamic Absorption Test
- AATCC METHOD 119 - Color Change Due to Flat Abrasion (frosting) Screen  
Wire Method

(Applications for copies should be addressed to the American Association of Textile Chemists and Colorists, PO Box 122215, Research Triangle Park, NC 27709-2215).

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D 2207 - Test Method for Bursting Strength of Leather by the Ball Method
- ASTM D 3776 - Mass per Limit Area (weight) of Woven Fabric
- ASTM D 5034 - Breaking Force and Elongation of Textile Fabrics: Grab Test

(Applications for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428).

## ANSI/ASQC Z1.4 SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES

(Applications for copies should be obtained from: American Society for Quality Control, 611 West Wisconsin Ave., Milwaukee, WI 53202).

2.7 Order of Precedence. In the event of a conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 First Article Test and Lot Acceptance Test. When specified, complete FILBE samples, unless otherwise stated, representing full production quality, shall be subjected to First Article Testing (FAT) in accordance with paragraph 4.2 and Quality Conformance Inspection in accordance with paragraph 4.3.

#### 3.2 System Requirements.

3.2.1 Fit. The FILBE components shall fit the United States Marine Corps 5th percentile female – 95th percentile male anthropometrics.

3.2.2 Compatibility. The FILBE components shall be compatible with currently fielded ballistic protection equipment, individual equipment, uniforms and weapons.

3.2.3 Empty Weight. When annotated, the FILBE component shall not exceed the maximum empty weight. Empty weight is defined as dry component, free of external equipment while maintaining all functional capability.

#### A) Corpsman Assault System

- a. Medical Assault Pack: The weight of one Medical Assault Pack shall not exceed 53.0 ounces.
- b. Medical Sustainment Bag: The weight of one Medical Sustainment Bag shall not exceed 30.0 ounces.
- c. Modular Medical Pouch: The weight of one Modular Medical Pouch shall not exceed 13.0 ounces.
- d. Medical Thigh Rig: The weight of one Medical Thigh Rig shall not exceed 14.0 ounces.
- e. Narc Pouch: The weight of one Narc Pouch shall not exceed 3.0 ounces.
- f. Medium Pouch: The weight of one Medium Pouch shall not exceed 4.0 ounces.
- g. Large Pouch: The weight of one Large Pouch shall not exceed 5.0 ounces.
- h. Small Reversible Pouch: The weight of one Small Reversible Pouch shall not

exceed 4.0 ounces.

- i. Medium Reversible Pouch: The weight of one Medium Reversible Pouch shall not exceed 6.0 ounces.
- j. Elastic Panel: The weight of one Elastic Panel shall not exceed 4.0 ounces.
- k. Double Pocket Panel: The weight of one Double Pocket Panel shall not exceed 4.0 ounces.
- l. Triple Pocket Panel: The weight of one Triple Pocket Panel shall not exceed 5.0 ounces.
- m. Stacked Pocket Panel: The weight of one Stacked Pocket Panel shall not exceed 4.0 ounces.

B) USMC Holster.

- a. The complete leg shroud platform with attached holster and quick disconnect adapters, shall not exceed 28.0 ounces.

B) USMC Pack System.

- a. Main Bag: The weight of one Main Bag shall not exceed 80.0 ounces.
- b. Frame: The weight of one Frame shall not exceed 30.0 ounces.
- c. Shoulder Harness Assembly: The weight of one Shoulder Harness shall not exceed 35.0 ounces.
- d. Hip Belt: The weight of one Hip Belt shall not exceed 25.0 ounces.
- e. Assault Pack: The weight of one Assault Pack shall not exceed 70.0 ounces.
- f. Assault Pouch: The weight of one Assault Pouch shall not exceed 7.0 ounces.
- g. Sustainment Pouch: The weight of one Sustainment Pouch shall not exceed 7.0 ounces.
- h. Hydration Pouch: The weight of one Hydration Pouch shall not exceed 6.0 ounces.
- i. Hydration Bladder System: The weight of one Hydration Bladder System shall not exceed 9.0 ounces.
- j. Sternum Cinch: The weight of one Sternum Cinch shall not exceed 4.0 ounces.

3.2.4 Resistance. The FILBE components shall be resistant to petroleum, oils and lubricants (POLs), corrosion, fungus, insect repellent, and salt water.

3.2.5 Reliability. Unless otherwise specified, the FILBE components shall have a Mean Time Between Operational Mission Failure (MTBOMF) of 360 hours. Additionally, the fabric used for the primary components shall be rot and mildew resistant and non-fabric parts of primary components shall be salt water-resistant.

3.2.6 Load Weight. The USMC Pack System (see paragraph 1.3) shall be capable of carrying a maximum combined load of 120 pounds.

3.2.7 Use and Care Manual/Instruction Card. All Use and Care Manuals/Instruction Cards shall provide the user with information necessary for installation, operation, maintenance, and training purposes.



3.3 USMC Pack. See paragraph 1.3 for a complete listing of USMC Pack components and subsystems.

3.3.1 Main Pack. The Main Pack of the USMC Pack is composed of one (1) Frame, one (1) Shoulder Harness Assembly, one (1) Hip Belt, and one (1) Main Bag. The Sustainment Pouches, Hydration Pouches, and Assault Pouch are attachable to the Main Pack's Pouch Attachment Ladder System (PALS) webbing. The dry weight of the Main Pack shall not exceed 170 ounces.

3.3.2 Frame. The USMC Pack Frame shall be capable of allowing the Main Pack to securely mount onto it without the use of tools. The Frame shall be made of a lightweight, high strength polymer that is resistant to fracture. When used in conjunction with the Hip Belt and Shoulder Harness, the Frame shall successfully distribute the load contained in the pack onto the user's hips and shoulders. The Frame shall be shaped in order to properly integrate with all fielded body armor systems. See paragraph 3.30.2 Durability and paragraph 4.6.5.1 Airdrop Slide Impact Test for specific requirements. The main pack Frame shall be Down East Inc. P/N 1606AC or equivalent. The color shall be Coyote 498.

3.3.3 Shoulder Harness Assembly. The Shoulder Harness shall be able to be rigidly mounted onto the Main Pack Frame without the use of tools. The harness shall be able to be moved up or down on the frame in order to accommodate different torso lengths. The harness shall have adjustable, padded shoulder straps that are used to carry the Main Pack. Adjustable load lifter straps shall attach the shoulder straps to the top of the harness in order to pull the load carried in closer to the user's body. A sternum strap shall allow the shoulder straps to be properly positioned on the user's body. In the case of an emergency doffing situation, the shoulder straps shall be able to be quickly separated using quick release hardware, allowing the pack to fall off the user.

3.3.4 Hip Belt. The Hip Belt shall be able to be rigidly mounted onto the Main Pack Frame without the use of tools. The Hip Belt shall be able to be securely tightened around the user's hips and fastened with a buckle. The Hip Belt shall tighten around the user's hips with a forward pulling motion. The Hip Belt shall comfortably transfer the majority of the load contained in the pack onto the user's hips, reducing the weight burden on the user's upper body.

3.3.5 Main Bag. The Main Bag shall consist of two compartments separated by a shelf. The lower compartment shall be separately accessible from the upper compartment using a slide fastener and shall be capable of containing fielded USMC sleep systems. The bag shall be able to be converted into one large compartment by opening a slide fastener located on the shelf. The bag shall have an extendable collar that extends approximately twelve inches and is capable of being cinched closed with an integrated cord and locking hardware device. A lid containing a pocket and capable of being secured closed with buckles shall cover the top opening of the Main Bag. A slide fastener on the lid shall allow access to the upper compartment. The exterior of the bag shall have PALS webbing used to mount modular pouches. A sleeve on each side of the bag shall be capable of retaining long items such as mortars or skis. Below each sleeve shall be a stretchable pocket in order to aid in the retention of the long item being carried. The bag shall have a handle on the top to aid in carrying when not worn on the back and two handles on the

back to aid in donning. The bag shall have webbing straps on the exterior used to compress loads carried. The Main Bag shall have an internal radio pocket capable of accommodating the Single Channel Ground Airborne Radio System (SinCGARS) radio and the Advanced SinCGARS Improved Program (ASIP) radio. The Main Bag shall have a means of allowing water to drain out.

3.3.5.1 Volume, Main Bag. The approximate internal volume of the Main Bag shall be 3,400 cubic inches in the main compartment and 1,600 cubic inches in the lower compartment.

3.3.6 Assault Pack. The Assault Pack shall consist of one main compartment and a fixed front pocket. The main compartment and the front pocket shall be capable of being secured closed using slide fasteners. Mesh pockets on the inside of the main compartment and front pocket shall keep small items secure. The Assault Pack shall have a removable plastic frame sheet. The exterior of the Assault Pack shall have PALS webbing used to mount modular pouches. The Assault Pack shall have adjustable, padded shoulder straps and an adjustable webbing hip belt, used to carry the pack. The shoulder straps and hip belt shall be capable of being stowed inside the back panel of the pack when not being used. The Assault Pack shall have webbing straps on the exterior used to compress loads carried and attach the pack onto the Main Pack. The Assault Pack shall have an internal radio pocket capable of accommodating the Single Channel Ground Airborne Radio System (SinCGARS) radio and the Advanced SinCGARS Improved Program (ASIP) radio. The top of the Assault Pack shall have a handle to aid in carrying when not worn on the back and two (2) access ports used for routing antennae or similar sized equipment out of the main compartment. The Assault Pack shall have a means of allowing water to drain out.

3.3.6.1 Volume, Assault Pack. The Assault Pack shall have an approximate internal volume of 1,525 cubic inches in the main compartment and 300 cubic inches in the front pocket.

3.3.7 Assault Pouch. One (1) Assault Pouch shall be included with the USMC Pack System. The pouch shall be capable of being mounted onto PALS webbing. The pouch shall have a means of allowing water to drain out. A slide fastener along the top of the pouch shall secure the pouch closed.

3.3.8 Sustainment Pouch. Two (2) Sustainment Pouches shall be included with the USMC Pack System. The pouches shall be capable of being mounted onto PALS webbing. Each pouch shall have an extendable collar that is capable of being cinched closed with an integrated cord and locking hardware device. A lid capable of being secured closed with a buckle shall cover the top opening of each pouch. The pouches shall have a means of allowing water to drain out. A Sustainment Pouch shall have an approximate internal volume of 500 cubic inches.

3.3.9 Hydration Pouch. Two (2) Hydration Pouches shall be included with the USMC Pack System. The pouches shall be capable of being mounted onto PALS webbing. Each pouch shall be capable of carrying a full 100 fluid ounce Hydration Bladder. A lid capable of being secured closed with a buckle shall cover the top opening of each pouch. A cord loop on the inside of each pouch shall allow the bladder to be attached and mitigate bladder movement. The pouches shall have a means of allowing water to drain out.

3.3.10 Hydration Carrier. The Hydration Carrier shall provide the user with the capability to drink without stopping while road marching with a fully loaded Main Pack. The Hydration Carrier shall be capable of being worn with attached shoulder straps. Two (2) small pockets on the front of the carrier shall allow the user to secure small items. The lower pocket shall have PALS webbing to allow attachment of modular pouches and other mission essential items. A lid, secured with two slide fasteners, shall cover the top opening of the carrier. The second pocket shall be located in the lid and shall be able to accommodate USMC microbiological filters and/or water treatment tablets. The Hydration Carrier shall have four (4) ITW Grimloc buckles or equivalent (see paragraph 3.12.1.2.14) contained in the lower front pocket.

3.3.11 Hydration Bladder System. The Hydration Bladder System shall fit securely in the Hydration Carrier (see paragraph 3.3.10) and shall include a front opening (fill port) to facilitate rapid filling or emptying. The Hydration Bladder System shall include one (1) Hydration Bladder, one (1) Hydration Tube with Cover, one (1) Tube Holder and one (1) Hydration Bite Valve with Cover. The Hydration Bladder System shall provide the user, while on-the-move, with the ability to transfer liquid from the bladder to their mouth. The system shall self-seal when not activated and be able to be placed in a hands free mode (i.e. "on" position). All connection points on the hydration bladder shall be compatible with USMC microbiological filters and currently fielded hydration tubes. The entire system shall be able to support a static load of 500 pounds without leaking when the bite valve is self-sealed and all other valves are closed while at room temperature (see paragraph 3.3.11.1). The Hydration Bladder System shall be CamelBak P/N 90817 (Bulk) / 90820 (Single), or equivalent.

3.3.11.1 Hydration Bladder. The bladder shall allow easy filling to full capacity while inserted or while not inserted into the carrier. The Hydration Bladder shall be able to maintain a sealed system when being removed or inserted into the Hydration Pouch or Hydration Carrier. The Hydration Bladder shall have a handle or grab point that allows for secure handling when opening, filling and closing.

- A) Capacity. The bladder shall have a minimum capacity of 100 fluid ounces ( $\pm$  1.0 fluid ounce).
- B) Cap/Fill Port. The cap of the Hydration Bladder shall tighten securely but be designed so that it cannot be over-tightened. The cap of the bladder must be easily opened and closed with one hand while wearing USMC issued cold weather gloves. The cap shall be tethered to the Hydration Bladder System to prevent loss.
- C) Bladder. The design of the bladder shall allow for a hand (3.14 inches minimum) to fit into the interior of the bladder in order for it to be cleaned. When fully filled with 100 fluid ounces of water, the bladder shall not exceed a total thickness of 3.0 inches.
- D) Material. The bladder shall be constructed from rugged, puncture resistant film with high tensile strength and burst resistant seams. The hydration bladder film shall accept a shock and deform elastically. The following tests may be performed by the Government in order to determine conformance: (1) The bladder filled to capacity shall be laid flat and compressed at the midline with a 20 square inch round anvil on

an Instron test machine with a 1,000 pound cell. It shall be set at 500 pound cyclic compression. Mechanical valves that restrict the flow of water to the bite valve shall be closed during the test. There shall be no damage or leakage after three cycles at a speed of 0.5 inches/minute. (2) The hydration bladder film shall meet a minimum puncture force of 20.23 pounds-force when tested to ASTM F1306-90 with a 0.125 inch diameter stylus moving at a velocity of 0.98 inches/minute. (3) Permanent deformation under stress shall be less than 25% when tested to ISO527-3 with the following conditions:

$$\text{Test Challenge: } \frac{L_t}{L_o} = 2.0$$

$$\text{Pass Result: } \frac{L_f}{L_o} \leq 1.25$$

$L_o$  = Original Length

$L_t$  = Test Length

$L_f$  = Final Length

- E) Antimicrobial. The bladder and tube shall have an antimicrobial treatment in the bladder material that will continuously inhibit fungus and bacteria from growing on all surfaces. The antimicrobial agent shall not contain Triclosan or other compounds which can degrade to dioxin or other harmful byproducts. The bladder film shall meet with the requirements of water/drink containers and have an independent approval to meet one of either US FDA requirements or European Equivalents.
- F) Quick Disconnect. The bladder shall have a female connection point where the tube connects via a male counterpart. The female connection point shall have a release button and an auto shut-off valve that engages when the tube is disconnected. The connection piece shall be made from food-grade materials. The auto-shutoff mechanism, release button mechanism, and the corresponding mating components of the female connector shall be functionally and dimensionally compliant with CPC P/N 3038100 or equivalent. The opposite portion of the female connector which marries to the bladder may be of a different configuration than P/N 3038100 to meet the specific requirements of the bladder.

3.3.11.2 Hydration Tube with Cover. The Hydration Tube shall contain one (1) on/off (shut off) switch integrated with a female connection point adjacent to the male Hydration Bite Valve connection point. The male connector shall be functionally and dimensionally compliant with CPC P/N APC22004 or equivalent, manufactured in food-grade materials compliant with U.S. FDA standards. The female connector which marries to the delivery tube shall be functionally and dimensionally compliant with CPC P/N APC170-04 or equivalent. The shut off valve shall be a single operation type by a lever action.

When the male tube connector is detached from the female connection point on the Hydration Bladder, the female connection point on the hydration bladder shall automatically seal, preventing liquid from leaking from the bladder.

When the bite valve is detached from the bite valve female connection point and the shut off valve is in the “off” position, liquid shall not leak out of the bite valve female connection point.

If the bite valve is lost or removed, the user shall be able to drink liquid directly from the bite valve female connection point by turning the shut off valve to the “on” position. To stop the flow of liquid without the bite valve in place, the user shall be able to manually turn the shut off valve to the “off” position.

- A) Tube Dimensions. The Hydration Tube length shall be a minimum of 39.37 inches long. The tube shall have a minimum inside diameter of 0.21 inches and a maximum outside diameter of 0.43 inches.
- B) Tube Cover. The Hydration Tube shall be equipped with a Coyote 498 sleeve that protects the tube from both UV exposure and abrasion
- C) Kink Distance. The Hydration Tube with Tube Cover shall meet a maximum kink distance of 7.50 inches when tested to EN13868 Annex A (short term kink resistance).
- D) Material. The Hydration Tube shall be free of hazardous phthalates as specified in the REACH Regulation (EC) No. 1907/2006 & limits for Substances for Very High Concern and California Proposition 65: Regulation of substance known to cause cancer, birth defects or other reproductive harm. The tube shall have fitment retention strength of at least 50 pounds between the tube and fittings when tested at room temperature after a six (6) hour heat cycle at 149°F and 85% humidity. The water contact material of the tube shall meet with the requirements of water/drink containers and have independent approval to meet one of either US FDA requirements or European equivalent.

3.3.11.3 Tube Holder. The Hydration Tube shall have a mechanism that allows the user to attach the Hydration Tube to the body armor or shoulder area when necessary. The attaching mechanism shall facilitate hands free drinking when the shut off valve is open. The Tube Holder shall be Camelbak P/N 90840 (Bulk) / 90837 (Single), or equivalent.

3.3.11.4 Hydration Bite Valve with Cover. The Hydration Bite Valve component shall be a straight design and be in-line with the Hydration Tube. The Hydration Bite Valve shall be easy to remove and replace. The Hydration Bite Valve shall be soft in the mouth with a return memory and allow hands free operation. The bite valve shall automatically self seal when not activated to prevent entry of outside matter and prevent loss of liquid. To protect the bite valve from dirt and debris, a cover shall encompass the entire soft mouth piece. The cover shall have a tether to prevent loss and be color Coyote 498.

3.3.11.5 Standards. Unless otherwise specified, the Hydration Bladder System shall comply with the following testing standards which govern the safety of plastics and other materials for water/food contact and consumption:

- A) US FDA Standards
  - a. US FDA 21 CFR 175.300 - Compliance with FDA for resinous and polymeric coatings
  - b. US FDA 21 CFR 177.1020 - Compliance with FDA for ABS

- c. US FDA 21 CFR 177.1210 - Compliance with FDA for polymer closures with sealing gaskets for food containers
- d. US FDA 21 CFR 177.1520 - Compliance with FDA for olefin polymers
- e. US FDA 21 CFR 177.1680 - Compliance with FDA for polyurethane resins
- f. US FDA 21 CFR 177.2470 - Compliance with FDA for polyoxymethylene copolymers - Acetal (Delrin)
- g. US FDA 21 CFR 177.2600 - Compliance with FDA for rubber articles
- h. US FDA 21 CFR 180.22 - Compliance with FDA for acrylonitrile copolymers
- i. FD&C Act: 21 U.S.C. 348 - Food Contact Notice

B) EU Standards

- a. Regulation EC 1935/2004 - European Community Regulation on materials and articles intended to come into contact with food
- b. Regulation EU 10/2011 - Plastic materials and articles intended to come into contact with food
- c. Directive 2002/72/EC - Directive related to plastic material and articles intended to come into contact with foodstuffs

C) Additional Relevant Standards

- a. REACH Regulation (EC) No. 1907/2006 & limits for Substances for Very High Concern
- b. California Proposition 65: Regulation of substance known to cause cancer, birth defects or other reproductive harm

3.3.12 Sternum Cinch. The Sternum Cinch shall be capable of attaching to all fielded body armor systems. When used properly, the Sternum Cinch shall mitigate the chance of pack related injuries to the user's arms and underarms by preventing the pack's shoulder straps from sliding off the body armor worn. The Sternum Cinch shall incorporate a quick-release mechanism to aid in pack doffing. The Sternum Cinch shall be Mystery Ranch P/N Mystery Cinch A1330 or equivalent. The color shall be Coyote 498.

3.3.13 Sub-Belt. The Sub-Belt shall be constructed from materials and components specified in section 3.12 of this document. Unless otherwise specified, the Sub-Belt shall integrate with all FILBE components without causing interference and allow individual equipment items to be securely attached without the use of tools. The Sub-Belt shall be compatible with the drop down components of the pistol holster. The Sub-Belt shall be padded and contain a minimum of two (2) rows of PALS webbing for at least 75% of the belt length.

3.3.14 Repair Kits.

- A) USMC Pack Buckle Repair Kit, User Level. This repair kit facilitates quick common field repairs that can be accomplished by the individual user without special skills or equipment. One (1) USMC Pack Buckle Repair Kit, User Level shall be furnished with each USMC Pack System. The USMC Pack Buckle Repair Kit, User level shall be packaged in a re-sealable clear plastic bag and be placed inside the Main Bag lid. The USMC Pack Buckle Repair Kit, User Level shall contain the following items or

equivalent:

ITW 350-2000	Toaster Ellipse Cordloc	Qty: 1
ITW 110-4100	Grimloc	Qty: 1
ITW 100	GTLL Split-bar	Qty: 1
ITW 810-1091		
or	1" Male Side Release	Qty: 2
National Molding 9700		
National Molding 9378	1" Female Snap-on Repairable	Qty: 2

B) USMC Pack Buckle Repair Kit, Unit Level. The USMC Pack Buckle Repair Kit, Unit Level shall contain the following items or equivalent:

ITW 350-2000	Toaster Ellipse Cordloc	Qty: 500
ITW 110-4100	Grimloc	Qty: 1000
ITW 100	GTLL Split-bar	Qty: 500
ITW 09223-27	MQRB Latch	Qty: 250
ITW 150-1150	1.5" TSR	Qty: 500
MIL-DTL-10884H	Snap Fastener Style 2	Qty: 100
MIL-G-16491	Grommet Ty III Cl 3 Sz 0	Qty: 100
Mystery Ranch A1330	Mystery Cinch	Qty: 250
National Molding 10151	2" Tensionlock Split-bar	Qty: 250
ITW 810-1091		
or	1" Male Side Release	Qty: 1000
National Molding 9700		
National Molding 9378	1" Female Snap-on Repairable	Qty: 1000
ITW 810-1080/810-1079		
or	2" Single Bar Side Release	Qty: 250
National Molding 10140/5431		

C) Hip Belt Buckle Repair Kit, Unit Level. The Hip Belt Buckle Repair Kit, Unit Level shall contain the following items or equivalent:

National Molding 10151	2" Tensionlock Split-bar	Qty: 100
ITW 810-1080/810-1079		
or	2" Single Bar Side Release	Qty: 100
National Molding 10140/5431		

3.3.15 USMC Pack Instruction Card. The system shall include an Instruction Card that provides the user with information necessary for installation, operation, maintenance, and training purposes. One (1) Instruction Card, made of lightweight, weather resistant material shall be furnished with each USMC Pack System and be placed in the lid pocket of the Main Bag.

3.4 Chest Rig. The Chest Rig shall provide the user with an alternate method of carrying the basic assault load on a body armor system and shall also be able to be used in a "stand-alone" configuration with a detachable harness. The Chest Rig shall allow users to rapidly transition

fighting loads between USMC fielded body armor systems. The Chest Rig shall be compatible with the quick release system of USMC fielded body armor systems without interfering with the quick release function.

- A) USMC Chest Rig. The USMC Chest Rig shall internally accommodate the following basic assault load: six (6) fully loaded M4/M16 magazines, one (1) PRC-148/153, one (1) GPS system (or like size item), and other equipment carried as part of the Marine's Basic Assault Load. One (1) USMC Chest Rig includes the following components: one (1) Marines (USMC) Chest Rig Assembly, one (1) Chest Rig Buckle Kit and one (1) Tri-Fold Instruction Card.

3.4.1 Chest Rig Repair Kit. The Chest Rig repair kit facilitates quick common field repairs that can be accomplished by the individual user without special skills or equipment. One (1) Chest Rig repair kit shall be furnished with each Chest Rig. Chest Rig Repair Kits are as follows:

- A) The USMC Chest Rig Buckle Kit. The repair kit includes the following buckles or equivalent:

ITW 810-1076-5679	1" Quick Attach Surface Mount	Qty: 6 U/I: Each
ITW 810-1072-5679	1" Single Bar Repairable, Male	Qty: 2 U/I: Each
ITW 810-1082-5679	1" Waveloc Repairable, Female	Qty: 2 U/I: Each
ITW 810-1083-5679	1" Waveloc Repairable, Male	Qty: 2 U/I: Each

- B) The USMC Chest Rig Repair Kit. The repair kit includes the following buckles and components. The buckles are stated item or equivalent. The USMC Chest Rig repair kit shall be placed in a re-sealable clear plastic bag and shall include the following:

Drawing # 2-6-0792	Attaching Strap, Assembly (Marines)	Qty: 4 U/I: Each
Drawing # 2-6-0852	IMTV/PC Attaching Strap, Assembly	Qty: 4 U/I: Each
ITW 810-1076-5679	1" Quick Attach Surface Mount	Qty: 6 U/I: Each
ITW 810-1072-5679	1" Single Bar Repairable, Male	Qty: 2 U/I: Each
ITW 810-1082-5679	1" Waveloc Repairable, Female	Qty: 2 U/I: Each
ITW 810-1083-5679	1" Waveloc Repairable, Male	Qty: 2 U/I: Each

3.5 Equipment Pouches. The Equipment Pouches shall be compatible with currently fielded ballistic protection equipment, individual equipment, uniforms, weapons and FILBE components. The pouches shall be compatible with all individual airborne rigging procedures.

3.6 USMC Holster System. The USMC Holster System shall provide a Marine with the ability to carry the fielded service pistol within the USMC Holster and to rapidly transition the USMC Holster between the leg, waist, and PALS location during simulated or actual combat operations. The USMC Holster System shall be comprised of one (1) Use and Care Instructions and four (4) pre-assembled components with associated quick disconnect adapters: Leg Shroud Platform; Low-Ride Belt Mount Platform; PALS Mount Platform and USMC Holster. The USMC Holster body, leg shroud, belt mount, PALS mount and all quick disconnect adapters shall be constructed of hard sided polymer and/or composite material. The USMC Holster System shall be available



in ambidextrous or right and left hand configurations. Unless otherwise specified, the color of all visible areas of the USMC Holster System shall be Coyote 498 by visual color matching. The USMC Holster System, to include all components, shall be certified to be operable in all climates from -60° F to 140° F. The USMC Holster System shall be compliant with the Berry Amendment.

3.6.1 USMC Holster System Right Hand Configuration (or ambidextrous equivalent). The USMC Holster System Right Hand Configuration (RHC) shall be Blackhawk P/N M990194CT-R or equivalent. The system shall include the following:

- A) USMC Holster (specific variant) with male quick disconnect adapter attached - right handed shooter or ambidextrous equivalent.
- B) Leg Shroud with female quick disconnect adapter attached - right handed shooter or ambidextrous equivalent.
- C) Low-Ride Belt Mount with female quick disconnect adapter attached.
- D) PALS Mount with female quick disconnect adapter attached.
- E) Use and Care Instructions.

3.6.2 USMC Holster System Left Hand Configuration (or ambidextrous equivalent). The USMC Holster System Left Hand Configuration (LHC) shall be Blackhawk P/N 0990194CT-L or equivalent. The system shall include the following:

- A) USMC Holster (specific variant) with male quick disconnect adapter attached - left handed shooter or ambidextrous equivalent.
- B) Leg Shroud with female quick disconnect adapter attached - left handed shooter or ambidextrous equivalent.
- C) Low-Ride Belt Mount with female quick disconnect adapter attached.
- D) PALS Mount with female quick disconnect adapter attached.
- E) Use and Care Instructions.

3.6.3 USMC Holster System Components. The USMC Holster System shall include the following components: one (1) USMC Holster with one (1) male quick disconnect adapter attached, one (1) Leg Shroud Platform with one (1) female quick disconnect adapter attached, one (1) Low-Ride Belt Mount Platform with one (1) female quick disconnect adapter attached, one (1) PALS Mount Platform with one (1) female quick disconnect adapter attached and one (1) Use and Care Instructions. The USMC Holster System components shall be interoperable and compatible with the currently fielded USMC Holster System.

3.6.3.1 USMC Holster. The USMC Holster shall accommodate at least one of the currently issued service pistols as defined in section 3.6.3.1.A - 3.6.3.1.C. The USMC Holster shall be constructed of hard sided polymer and/or composite material. The USMC Holster shall cover the trigger, trigger guard and rear sights. The USMC Holster shall have one (1) passive/friction retention function and one (1) active/mechanical retention system. The USMC Holster shall allow for the safe carriage of the pistol with a round in the chamber and not require or cause the slide to be manipulated. The USMC Holster cant shall be adjustable and capable of being rotated 45° forward or backward on the PALS mount. The USMC Holster shall allow for the

establishment of a proper firing grip without the need to re-establish the grip after the pistol is drawn.

- A) USMC Holster - M9 and M9A1 without light. The USMC Holster - M9/M9A1 without light variant shall accommodate the M9 and M9A1 Service Pistol without light and be fully interoperable and compatible with the USMC Holster System.
- B) USMC Holster - M9A1 with light. The USMC Holster - M9A1 with light variant shall accommodate the M9A1 Service Pistol with light and be fully interoperable and compatible with the USMC Holster System.
- C) USMC Holster - M45. The USMC Holster - M45 variant shall accommodate the .45 caliber service pistol and be fully interoperable and compatible with the USMC Holster System.

3.6.3.2 Quick Disconnect Adapters. The quick disconnect adapters shall be constructed of hard sided polymer and/or composite material. They shall allow for rapid transition, without the use of tools, of the USMC Holster to all platforms within the USMC Holster System. They shall be fully operable with gloved hands.

- A) Male Quick Disconnect Adapter. The male quick disconnect adapter shall fit into the female quick disconnect adapter included in the USMC Holster System. It shall be able to be assembled to all variants of the USMC Holster without modification to the USMC Holster or any disconnect adapter. The male quick disconnect adapter will be assembled on the USMC Holster within the USMC Holster System.
- B) Female Quick Disconnect Adapter. The female quick disconnect adapters shall be compatible with the male quick disconnect adapter and be operable with gloved hands. It shall be able to be assembled to all platforms without modification to the disconnect adapter or platform. The female quick disconnect adapter will be assembled to the respective platform (waist, leg or PALS) within the USMC Holster System. The female quick disconnect adapter shall be Blackhawk P/N 430952CT or equivalent.

3.6.3.3 Leg Shroud Platform. The Leg Shroud Platform shall allow the user to carry the USMC Holster on his thigh during simulated and actual combat operations. The Leg Shroud Platform shall attach to the user's belt in at least one (1) position and around the thigh in at least one (1) location in order to provide increased stability without impacting mobility. The platform shall be available in right and left handed configurations if it is not ambidextrous. The shell of the leg shroud shall be constructed of hard sided polymer and/or composite material. One (1) female quick disconnect adapter will be assembled to the Leg Shroud Platform within the USMC Holster System.

3.6.3.4 Low-Ride Belt Mount Platform. The Low-Ride Belt Mount Platform shall allow the user to carry the USMC Holster on the waist belt or sub-belt. The Low-Ride Belt Mount Platform shall allow for attachment of the platform without tools. The platform shall be

constructed of hard sided polymer and/or composite material. One (1) female quick disconnect adapter will be assembled to the Low-Ride Belt Mount Platform within the USMC Holster System.

3.6.3.5 PALS Mount Platform. The PALS Mount Platform shall allow the user to carry the USMC Holster on the currently fielded body armor PALS webbing. The platform shall provide a stable platform for the USMC Holster in order to reduce shifting or snags. The platform shall be constructed of hard sided polymer and/or composite material. One (1) female quick disconnect adapter will be assembled to the PALS Mount Platform within the USMC Holster System. The PALS Mount Platform shall be Blackhawk P/N 38CL63CT or equivalent.

3.6.3.6 Use and Care Instructions. The Use and Care Instructions shall provide basic guidance of the form, fit and function of the USMC Holster System. One (1) set of instructions will be included with each USMC Holster System.

3.7 Corpsman Assault System. See paragraph 1.3 for a complete listing of Corpsman Assault System (CAS) components and subsystems. The dry weight of the CAS shall not exceed 172 ounces.

3.7.1 Medical Assault Pack. The Medical Assault Pack shall consist of one main compartment and a fixed lower pocket. The main compartment and the lower pocket shall be capable of being secured closed using slide fasteners. The Medical Assault Pack shall have a removable plastic frame sheet. The exterior of the Medical Assault Pack shall have PALS webbing used to mount modular pouches. The Medical Assault Pack shall have adjustable, padded shoulder straps and an adjustable webbing hip belt, used to carry the pack. The shoulder straps and hip belt shall be capable of being stowed inside the back panel of the pack when not being used. The Medical Assault Pack shall have webbing straps on the exterior used to compress loads carried. The webbing straps shall allow the Medical Sustainment Pack (see paragraph 3.7.2) to attach to the assault pack and allow the assault pack to attach onto the USMC Pack System's Main Pack (see paragraph 3.3.1). The Medical Assault Pack's interior shall have loop fastener used to mount Medical Inserts (see paragraph 3.7.5). The top of the assault pack shall have a handle to aid in carrying when not worn on the back and two (2) access ports used for routing hydration tubes or similar sized equipment out of the main compartment. A pocket underneath the handle capable of being secured closed using a slide fastener shall allow small mission essential items to be easily accessed. The assault pack shall have a means of allowing water to drain out.

3.7.2 Medical Sustainment Bag. The Medical Sustainment Bag shall consist of one main compartment. The main compartment shall be capable of being secured closed using a slide fastener. The Medical Sustainment Bag shall have adjustable shoulder straps used to carry the bag. The shoulder straps shall be capable of being stowed inside the back panel of the bag when not being used. The Medical Sustainment Bag shall have webbing straps on the exterior used to compress loads carried. The webbing straps shall allow the Medical Sustainment Bag to attach to the Medical Assault Pack (see paragraph 3.7.1). The sustainment bag interior shall have loop fastener used to mount Medical Inserts (see paragraph 3.7.5). The top of the sustainment bag shall have a handle to aid in carrying when not worn on the back and to allow the bag to be hung open for ease of access. The sustainment bag shall have a means of allowing water to drain out.

3.7.3 Medical Thigh Rig. The Medical Thigh Rig shall consist of one compartment that is capable of being secured closed using a slide fastener. The Medical Thigh Rig shall have a webbing adjustment strap that allows the user to mount the thigh rig at a desired location on the thigh. The adjustment strap shall attach to user's body armor system, sub-belt or other individual equipment using a hook and loop fastener assembly. The thigh rig shall be capable of being attached/detached from the hook and loop fastener assembly using a side-release buckle. Elastic grip webbing and a side-release buckle shall firmly attach the thigh rig to the user's thigh and prevent the thigh rig from moving. The interior of the thigh rig shall contain various pockets, elastic webbing loops and round cord to securely hold medical supplies.

3.7.4 Modular Medical Pouch. The Modular Medical Pouch shall consist of one compartment that is capable of being secured closed using two slide fasteners. The pouch shall be capable of being mounted onto PALS webbing. The interior of the pouch shall have loop fastener used to mount Medical Inserts (see paragraph 3.7.5). The Modular Medical Pouch shall have a means of allowing water to drain out.

#### 3.7.5 Medical Inserts.

3.7.5.1 Narc Pouch. The Narc Pouch shall consist of a single pocket used to hold a hard-sided plastic case. The pocket shall secure the plastic case using a webbing strap. The Narc Pouch shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. One (1) Narc Pouch shall be included with the CAS.

3.7.5.2 Medium Pouch. The Medium Pouch shall be capable of being secured closed using a slide fastener. The pouch shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. Two (2) Medium Pouches shall be included with the CAS.

3.7.5.3 Large Pouch. The Large Pouch shall be capable of being secured closed using a slide fastener. The pouch shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. Two (2) Large Pouches shall be included with the CAS.

3.7.5.4 Small Reversible Pouch. The Small Reversible Pouch shall be capable of being secured closed using a reversible slide fastener. The pouch shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. The pouch shall be capable of being turned inside out and mounted onto PALS webbing. Two (2) Small Reversible Pouches shall be included with the CAS.

3.7.5.5 Medium Reversible Pouch. The Medium Reversible Pouch shall be capable of being secured closed using a reversible slide fastener. The pouch shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. The pouch shall be capable of being turned inside out and

mounted onto PALS webbing. Two (2) Medium Reversible Pouches shall be included with the CAS.

3.7.5.6 Elastic Panel. The Elastic Panel shall have four (4) rows of various sized elastic webbing loops used to secure medical supplies. An adjustable round cord shall allow a tape roll(s) to be secured and easily accessed. The panel shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or the Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. Two (2) Elastic Panels shall be included with the CAS.

3.7.5.7 Double Pocket Panel. The Double Pocket Panel shall have two (2) pockets adjacent to one another. The openings of the pockets shall be capable of being tightened using elastic cord and barrel locks. The panel shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1), Medical Sustainment Bag (see paragraph 3.7.2) or Modular Medical Pouch (see paragraph 3.7.4) using hook fastener. One (1) Double Pocket Panel shall be included with the CAS.

3.7.5.8 Triple Pocket Panel. The Triple Pocket Panel shall have three (3) pockets adjacent to one another. The openings of the pockets shall be capable of being tightened using elastic cord and barrel locks. The panel shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1) or Medical Sustainment Bag (see paragraph 3.7.2) using hook fastener. One (1) Triple Pocket Panel shall be included with the CAS.

3.7.5.9 Stacked Pocket Panel. The Stacked Pocket Panel shall have two (2) different sized pockets. The smaller pocket shall be placed on top of the larger pocket allowing easier access to the contents contained within. The openings of the pockets shall be capable of being tightened using elastic cord and barrel locks. The panel shall be capable of being mounted into the Medical Assault Pack (see paragraph 3.7.1), Medical Sustainment Bag (see paragraph 3.7.2) or Modular Medical Pouch (see paragraph 3.7.4) using hook fastener. One (1) Stacked Pocket Panel shall be included with the CAS.

3.8 Reserved for future use.

3.9 Reserved for future use.

3.10 Reserved for future use.

3.11 Standard Sample. When applicable, the finished cloths or findings shall match the standard samples for shade, appearance and with respect to all characteristics for which the standard sample is referenced.

3.12 Materials and Components. The contractor shall select the materials that meet all applicable specifications, standards, and patterns specified herein. Material and component manufacturers referenced within this document are listed in alphabetical order, not by preference. Similar materials and components to those referenced within this document are determined to be equivalent solely by the Government. During determination of equivalency, the Government reserves the right to perform any of the inspections set forth in this document where such

inspections are deemed necessary to ensure the supplies conform to prescribed requirements.

3.12.1 Hardware. Unless otherwise specified, all hardware shall be compatible with FILBE components and the associated hardware of the components. Unless otherwise specified, the color of all hardware shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 - Coyote 498, Class 4 - Arctic White 488, Class 5 - Tan 499 and shall meet the Infrared Spectral Reflectance requirements in Tables III through X. Hardware shall conform to the following requirements.

3.12.1.1 Barrel lock.

3.12.1.1.1 Barrel lock. The barrel lock shall be ITW P/N GTSP Cordloc 350-6000 or equivalent.

3.12.1.1.2 Barrel lock. The barrel lock shall be ITW P/N Toaster Ellipse Cordloc 350-2000 or equivalent. The barrel lock shall be in the “closed” position (i.e. cinching the cord).

3.12.1.1.3 Barrel lock. The barrel lock shall be National Molding P/N Pop Lock 6523 or equivalent.

3.12.1.2 Buckle.

3.12.1.2.1 Buckle, nonslip double bar. The 1.0 inch quick release nonslip buckle shall conform to MIL-B-543 Type V Class III. The nonslip buckle shall be ITW Waterbury P/N 00648-09 or equivalent.

3.12.1.2.2 Buckle, repairable, female. The 1.0 inch female repairable buckle shall be ITW P/N 810-1082 or equivalent.

3.12.1.2.3 Buckle, repairable, male. The 1.0 inch male repairable buckle shall be ITW P/N 810-1083 or equivalent.

3.12.1.2.4 Buckle, repairable, single-bar, male. The 1.0 inch male single-bar repairable buckle shall be ITW P/N 810-1072 or equivalent.

3.12.1.2.5 Buckle, quick attach, female. The 1.0 inch female quick attach surface mount buckle shall be ITW P/N 810-1076 or equivalent.

3.12.1.2.6 Buckle, side release. The 1.0 inch side release buckle shall be National Molding P/N 5000, 5707, 5709 or equivalent.

3.12.1.2.7 Buckle, side-release. The 2.0 inch center release buckle shall be ITW P/N GTCR 154-5050 or equivalent.

3.12.1.2.8 Buckle, quick-release, female. The 1.0 inch metal quick release buckle housing shall be ITW P/N 09223-26 or equivalent.

3.12.1.2.9 Buckle, quick-release, male. The 1.0 inch metal quick release buckle latch shall be

ITW P/N 09223-27 or equivalent.

3.12.1.2.10 Buckle, friction. The 1.0 inch male friction buckle shall be ITW P/N GTSR Wavloc XL 810-1091 or National Molding P/N Techno Grab 9700, or equivalent.

3.12.1.2.11 Buckle, friction. The 1.0 inch female friction buckle shall be National Molding P/N Techno Grab 10023 or equivalent.

3.12.1.2.12 Buckle, repairable. The 1.0 inch male repairable buckle shall be National Molding P/N Snap On Repairable 9739 or equivalent.

3.12.1.2.13 Buckle, repairable. The 1.0 inch female repairable buckle shall be National Molding P/N Snap On Repairable 9378 or equivalent.

3.12.1.2.14 Buckle. The buckle shall be ITW P/N Grimloc 110-4100 or equivalent.

3.12.1.2.15 Buckle, side-release. The 1.0 inch side release buckle shall be National Molding P/N Heavy Duty Mojave Buckle 8781 or equivalent.

3.12.1.2.16 Buckle, side-release. The 1.0 inch female side release buckle shall be ITW P/N GTSR 810-1057 or National Molding P/N Heavy Duty Mojave Buckle 8762, or equivalent.

3.12.1.2.17 Buckle, side-release. The single-bar 2.0 inch side release buckle shall be ITW P/N GTSR Loop 810-1077/810-1079 or National Molding P/N Lock Monster 10140/5431, or equivalent.

3.12.1.2.18 Buckle, side-release. The 2.0 inch side release buckle shall be ITW P/N Contoured Waist Belt Buckle TSR200 815-0006/815-0007 or equivalent.

3.12.1.2.19 Buckle, side-release. The 0.75 inch side release buckle shall be National Molding P/N Mojave Side Squeeze Buckle Male 5205 and Female 5206, or equivalent.

3.12.1.2.20 Buckle, side-release. The 0.75 inch side release buckle shall be ITW P/N TSR 150-0075 or equivalent.

3.12.1.2.21 Buckle, side-release. The 1.0 inch side release buckle shall be ITW P/N TSR 150-0100 or equivalent.

3.12.1.2.22 Buckle, side-release. The 1.5 inch side release buckle shall be ITW P/N TSR 150-1150 or equivalent.

3.12.1.2.23 Buckle, side-release. The 1.0 inch female side release buckle shall be ITW P/N GTSR Ladderloc 810-1070 or National Molding P/N Dual Adjustment Side Squeeze Buckle 5317, or equivalent.

3.12.1.2.24 Toggle. The toggle shall be ITW P/N GT Tactical Toggle 743-0200 or equivalent.

3.12.1.2.25 Buckle, side-release. The 1.0 inch male side release buckle shall be ITW P/N GTSR 810-1071 or National Molding P/N Heavy Duty Mojave Buckle 8761, or equivalent.

3.12.1.3 D-ring.

3.12.1.3.1 D-ring, plastic. The 1.0 inch D-ring shall be ITW P/N 110-0100 or National Molding P/N 4275, or equivalent.

3.12.1.3.2 D-ring, metal. The metal D-ring shall be ITW P/N 01047-20 or equivalent.

3.12.1.4 Eyelet.

3.12.1.4.1 Eyelet. The metal eyelets shall conform to MIL-E-20652/1B dash numbers BBE-114, BBW101, brass and have a dull chemical finish suitable for copper alloys.

3.12.1.4.2 Eyelet. The metal eyelets shall conform to MIL-E-20652/1B dash number ABE-131, aluminum with a chemical finish.

3.12.1.5 Fastener.

3.12.1.5.1 Fastener, snap (regular wire spring clamp type). The snap fasteners shall conform to MIL-DTL-10884H, Style 2. The snap fasteners shall have a black chemical finish, except button cap shells be color as specified, baked on enamel finish. The enamel shall be uniformly coated over the top surface of the shell including the visible portion of the edge. The gloss for the black chemical finish and the enamel finish shall be no more than 40. The enamel shall be capable of withstanding attachment operations without removal of any enamel. The enamel coating shall be smooth and free of sags, runs and streaks.

3.12.1.5.2 Fastener, snap (small wire spring clamp type). The snap fasteners shall conform to MIL-DTL-10884H, Style 2A. The snap fasteners shall have a black chemical finish, except button cap shells be color as specified, baked on enamel finish. The enamel shall be uniformly coated over the top surface of the shell including the visible portion of the edge. The gloss for the black chemical finish and the enamel finish shall be no more than 40. The enamel shall be capable of withstanding attachment operations without removal of any enamel. The enamel coating shall be smooth and free of sags, runs and streaks.

3.12.1.6 Grommet.

3.12.1.6.1 Grommet. The grommets shall conform to MIL-G-16491, Type III, Class 3, Size 0.

3.12.1.6.2 Grommet. The grommets shall conform to MIL-G-16491, Type III, Class 3, Size 1.

3.12.1.7 Oval Slide.

3.12.1.7.1 Oval slide, rounded. The 1.0 inch rounded oval slide shall be ITW Waterbury P/N



08090-22 or equivalent.

3.12.1.8 Ring.

3.12.1.8.1 Ring, oval. The 1.0 inch oval ring shall be ITW Waterbury P/N 01004-20 or equivalent. The ring shall be welded.

3.12.1.8.2 Ring, oval. The 2.0 inch oval ring shall be ITW Waterbury P/N 00012-20 or equivalent. The ring shall be welded.

3.12.1.9 Buckle, friction.

3.12.1.9.1 Tri-glide. The 1.0 inch tri-glide shall be ITW P/N 105-0100 or National Molding P/N Heavy Duty Sliplock 4783, or equivalent.

3.12.1.9.2 Buckle, sternum. The 1.0 inch sternum buckle shall be ITW P/N Sternum Tri-glide 642-0100 or National Molding P/N Heavy Duty Sternum Slider 9382, or equivalent.

3.12.1.9.3 Buckle, sternum. The repairable sternum buckle shall be ITW P/N Split Bar Triglide 646-2025 or National Molding P/N Heavy Duty Sternum Slider 9380, or equivalent.

3.12.1.9.4 Buckle, lock. The 2.0 inch lock buckle shall be National Molding P/N 10151 or equivalent.

3.12.1.9.5 Buckle, lock. The 2.0 inch lock buckle shall be ITW P/N GT Ruck 200 or equivalent.

3.12.1.9.6 Buckle, lock. The 1.0 inch repairable lock buckle shall be ITW P/N GTLL 100 Split-bar or equivalent.

3.12.1.9.7 Buckle, lock. The 1.0 inch lock buckle shall be ITW P/N GTLL 154-0200 or equivalent.

3.12.1.9.8 Buckle, lock. The 1.0 inch lock buckle shall be National Molding P/N Mega Duckbill with Hole 7352 or equivalent.

3.12.1.9.9 Buckle, lock. The 2.0 inch repairable lock buckle shall be National Molding P/N 10151 Split Bar or equivalent.

3.12.1.9.10 Buckle, lock. The 0.5 inch lock buckle shall be National Molding P/N Standard Tensionlock 4925 or equivalent.

3.12.1.9.11 Buckle, lock. The 1.0 inch lock buckle shall be ITW P/N Ladderloc 104-0100 or National Molding P/N Standard Tensionlock 4199, or equivalent.

3.12.1.9.12 Buckle, lock. The 1.0 inch repairable lock buckle shall be ITW P/N Ladderloc Split-bar 104-3100 or equivalent.

3.12.1.9.13 Hook. The hook shall be National Molding P/N Glove Hook 4891 or equivalent. Color shall be black.

3.12.1.9.14 Tri-glide. The 1.5 inch tri-glide shall be ITW P/N Low-Pro Triglide 105-2150 or equivalent.

3.12.2 Foam. Foam shall conform to the following requirements.

3.12.2.1 Foam. The 0.5 inch thick foam padding shall conform to ASTM-D-6576 Type II, grade C, condition soft.

3.12.2.2 Foam. The 0.25 inch thick foam padding shall conform to ASTM-D-6576 Type II, grade C, condition soft.

3.12.2.3 Foam. The foam shall be closed cell cross-linked ethylene vinyl acetate copolymer foam with a thickness of 0.375 inch. The foam shall conform to the properties specified in Table I-A when tested in accordance with ASTM D-3575.

3.12.2.4 Foam. The foam shall be closed cell cross-linked ethylene vinyl acetate copolymer foam with a thickness of 0.625 inch. The foam shall conform to the properties specified in Table I-A when tested in accordance with ASTM D-3575.

**Table I-A. Foam Characteristics** (see 3.12.2)

<b>Characteristic</b>	<b>Requirement</b>
Density (lb/ft <sup>3</sup> )	3.15 ± 0.15
Compression Strength (psi) @ 25% deflection	6.5 ± 0.5
@ 50% deflection	15.5 ± 0.5
Elongation at Break (%) (min)	220
Tear Resistance (lbf/in) (min)	19
Water Absorption of Surface (lb/ft <sup>2</sup> ) (max)	0.04

3.12.2.5 Foam, molded hip-belt. The molded hip belt foam shall be UFP P/N MOLLE II Molded Waistbelt USMC variant using a four way stretch woven fabric as the facing, or equivalent.

3.12.2.6 Foam. The reinforcing foam shall be 10 lb/ft<sup>3</sup> ± 10 % density, cross-linked polyethylene foam with a thickness of 0.25 inch.

3.12.2.7 Foam. The foam shall be open-cell polyether based polyurethane foam with a thickness of 1.0 inch. The foam shall conform to the properties in Table I-B when tested in accordance with ASTM D-3574.

3.12.2.8 Foam. The foam shall be open-cell polyether based polyurethane foam with a thickness of 0.75 inch. The foam shall conform to the properties in Table I-B when tested in accordance with ASTM D-3574.

**Table I-B. Foam Characteristics** (see 3.12.2)

<b>Characteristic</b>	<b>Requirement</b>
Density (lb/ft <sup>3</sup> )	2.5 ± 0.25
Indentation Force Deflection (lb/50 in <sup>2</sup> ) @ 25% deflection	130 ± 10
@ 65% deflection	230 ± 10
Elongation at Break (%) (min)	100
Tensile Strength (psi) (min)	25

3.12.2.9 Foam. The foam shall be low-density, cross-linked polyethylene foam with a thickness of 0.1875 inch.

3.12.3 Stiffener. Stiffener shall conform to the following requirements.

3.12.3.1 Stiffener, plastic. The plastic stiffener shall be high density polyethylene, 0.030 inch thick. The color shall be Natural.

3.12.3.2 Stiffener, plastic. The plastic stiffener shall be high density polyethylene, 0.045 inch thick. The color shall be Natural.

3.12.3.3 Stiffener, plastic. The plastic stiffener shall be high density polyethylene, 0.060 inch thick. The color shall be Black or Natural.

3.12.3.4 Stiffener, plastic. The plastic stiffener shall be high density polyethylene, 0.125 inch thick. The color shall be Black.

3.12.3.5 Stiffener, plastic. The plastic stiffener shall be polyester strapping with dimensions 0.5 inch by 0.028 inch. Length shall be as specified on patterns. The stiffener shall have a minimum tensile strength of 820 lbs ± 10. The color shall be Black or Natural.

3.12.3.6 Stiffener, fiberglass. The fiberglass pultrusion strip shall be 0.125 inch in height by 0.375 inch wide. Length shall be 8.5 inches. The color shall be Natural.

3.12.4 Webbing and tapes. Webbing and tapes shall be heat cut smooth with no burrs or residual melt. Unless otherwise specified the color shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 - Coyote 498, Class 4 - Arctic White 488, Class 5 - OCP (4-Color) and shall meet the requirements in Tables III through X. Webbing and tapes shall conform to the following requirements.

3.12.4.1 Webbing, 1.0 inch. The 1.0 inch webbing shall conform to A-A-55301, Type III, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used.

3.12.4.2 Webbing, 1.5 inch. The 1.5 inch webbing shall conform to A-A-55301, Type VI, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used. When used, thickness shall be 0.039 inch (min); weight shall be 0.90 oz/yd (min).

3.12.4.3 Webbing, 2.0 inch. The 2.0 inch webbing shall conform to MIL-W-17337, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used. When used, continuous filament textured nylon yarn denier shall be 1000 warp and 500 fill; breaking strength shall be 1450 pounds (min); thickness shall be 0.042 inch (min) to 0.054 inch (max); filling yarns per inch shall be 40; full warp ends shall be 160; and width binder ends shall be 38.

3.12.4.4 Webbing, 3.0 inch. The 3.0 inch webbing shall conform to MIL-W-17337, Class 2. Continuous filament textured nylon shall be used.

3.12.4.5 Tape, 1.0 inch. The 1.0 inch tape shall conform to MIL-PRF-5038, Type III, Class 2. Continuous filament textured yarns shall be used except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1.

3.12.4.6 Webbing, nylon. The 0.75 inch webbing shall conform to MIL-W-17337, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used. When used, the continuous filament textured nylon webbing shall have a tensile strength of 600 pounds (min); thickness shall be 0.035 inch (min); weight 0.35 oz/yd (min).

3.12.4.7 Webbing, nylon. The 2.0 inch woven nylon webbing shall conform to MIL-W-4088, Type VIIIb, Class 2.

3.12.4.8 Webbing, nylon. The 0.5 inch webbing shall conform to MIL-W-17337, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used. When used, the continuous filament textured nylon webbing shall have a tensile strength of 350 pounds (min); thickness shall be 0.035 inch (min); weight 0.25 oz/yd (min).

3.12.4.9 Tape, 0.375 inch. The 0.375 inch tape shall conform to MIL-PRF-5038 Type III. Continuous filament textured yarns shall be used except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1.

3.12.4.10 Tape, 0.875 inch. The 0.875 inch bias tape shall conform to MIL-PRF-5038, except that the spectral reflectance requirements shall be in accordance with paragraph 3.27.3 and Tables III through X when tested in accordance with paragraph 4.7.1. Producer colored, textured yarns may be used. When used, the continuous filament textured nylon tape shall have a tensile

strength of 300 pounds (min); thickness shall be 0.020 inch (min); weight 0.20 oz/yd (min).

3.12.5 Webbing, elastic. Elastic webbing shall be heat cut smooth with no burrs or residual melt. Unless otherwise specified the Color shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 - Coyote 498, Class 4 - Arctic White 488, Class 5 - Tan 499 and shall meet the requirements in paragraph 3.27.3 and Tables III through X. Elastic webbing shall conform to the following requirements.

3.12.5.1 Webbing, elastic. Width – 1.0 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/1, filler – textured polyester 750d total, rubber – natural or equivalent, rubber strands – 60, thickness - 0.040-0.045, picks per inch – 50  $\pm$ 4, stretch – 110%  $\pm$ 15%.

3.12.5.2 Webbing, elastic. Width – 1.5 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/1, filler – textured polyester 750d total, rubber – natural or equivalent, rubber strands – 60, thickness - 0.040-0.045, picks per inch – 50  $\pm$ 4, stretch – 110%  $\pm$ 15%.

3.12.5.3 Webbing, elastic. Width – 3.0 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/1, filler – textured polyester 750d total, rubber – natural or equivalent, rubber strands – 60, thickness - 0.040-0.045, picks per inch – 50  $\pm$ 4, stretch – 110%  $\pm$ 15%.

3.12.5.4 Webbing, elastic. Width – 4.0 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/1, filler – textured polyester 750d total, rubber – natural or equivalent, rubber strands – 60, thickness - 0.040-0.045, picks per inch – 50  $\pm$ 4, stretch – 110%  $\pm$ 15%.

3.12.5.5 Webbing, elastic. Width – 0.5 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/1, filler – textured polyester 750d total, rubber – natural or equivalent, rubber strands – 60, thickness - 0.040-0.045, picks per inch – 50  $\pm$ 4, stretch – 110%  $\pm$ 15%.

3.12.5.6 Webbing, elastic. Width – 0.75 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/2, filler – textured polyester 150/1, rubber – natural or equivalent, thickness - 0.060-0.080, stretch – 110%  $\pm$ 15%.

3.12.5.7 Webbing, elastic. Width – 1.0 inch  $\pm$  0.060, construction – knitted, warp – textured polyester 150/2, filler – textured polyester 150/1, rubber – natural or equivalent, thickness - 0.060-0.080, stretch – 110%  $\pm$ 15%.

3.12.5.8 Webbing, elastic, grip. Width – 1.5 inch  $\pm$  0.060, construction – knitted, warp – textured nylon 150/2, filler – textured nylon 150/1, rubber – natural or equivalent, thickness - 0.060-0.080, stretch – 110%  $\pm$ 15%. The elastic webbing shall have two rows (4 strands in each row) of rubber elastic woven in. The elastic webbing shall be color Coyote 498 and meet the requirements in paragraph 3.27.3 and Table III. The rubber strands shall be color Black and are exempt from meeting IR requirements.

3.12.6 Fastener, hook and loop. Hook and loop fastener shall conform to A-A-55126, Type II, Class 1 or Class 4, in 5/8 inch, 0.75 inch, 1.0 inch, 1.5 inch, 2.0 inch, and 4.0 inch widths. Unless otherwise specified the color shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 -

Coyote 498, Class 4 - Arctic White 488, Class 5 - Tan 499 and shall meet the requirements in paragraph 3.27.3 and Tables III through X.

3.12.6.1 Fastener, loop, sheet. The heavy duty knit loop fastener shall be Velcro P/N Loop 3001 or equivalent. The width shall be as required on patterns. The color shall be Coyote 498 and meet the requirements in paragraph 3.27.3 and Table III.

3.12.7 Cloth. Unless otherwise specified, the color shall be: Class 1 - Coyote 498, Class 2 - Woodland MARPAT, Class 3 - Desert MARPAT, Class 4 - Snow MARPAT, Class 5 - OCP. The infrared reflectance of the finished cloth shall conform to the requirements specified in Tables III through X when tested as specified in paragraph 4.7.1. Cloth shall conform to the following requirements.

3.12.7.1 Cloth, nylon. The 1000 denier textured nylon duck cloth shall conform to GL/PD 10-07 Type I Class 3.

3.12.7.2 Cloth, nylon. The 500 denier textured nylon duck shall conform to GL/PD 10-07 Type III Class 3.

3.12.7.3 Cloth, nylon. The water repellent nylon plain weave cloth shall conform to MIL-C-43128.

3.12.7.4 Cloth, nylon. The 400 denier nylon plain weave cloth shall have a 0.75 ounce urethane back coating, durable water repellent treatment and weigh not more than 5.75 ounces per square yard. The cloth shall have a minimum fabric count of 55 yarns per inch in the warp and 38 yarns per inch in the fill. The minimum breaking strength shall be 150 pounds in the warp direction and 75 pounds in the fill direction; maximum shrinkage of 3 percent in both directions; initial minimum spray rating of 90, 90, 80 and 80, 80, 80 after one laundering; minimum hydrostatic resistance of 20 centimeters.

3.12.7.5 Cloth, mesh. The raschel knit nylon cloth shall conform to MIL-C-8061 Type II. The cloth shall weigh not more than 11.5 ounces per square yard; have a thickness of not more than 0.05 inch, a minimum bursting strength of 325 pounds, a minimum breaking strength of 315 pounds in the wale direction and 200 pounds in the course direction, and a minimum tearing strength of 25 pounds in both directions. The cloth shall have a maximum shrinkage of 7.5 percent in both directions, a maximum ultimate elongation of 95 percent in the wale direction and 140 percent in the course direction, and a maximum stiffness (load-pounds) of 0.010 in the wale direction and 0.010 in the course direction. A non-durable acrylic finish shall be used to meet the stiffness requirements.

3.12.7.6 Cloth, mesh. The mesh cloth shall be Dri-lex P/N Aerospacer #622 or equivalent.

3.12.7.7 Cloth, nylon. The cloth shall be 70 denier 1.9 ounce nylon ripstop. Yarns per inch shall be at a minimum of 97 in the fill direction and 105 in the warp direction. The nylon ripstop shall have a minimum spray rating of 100, 100, 100.

3.12.8 Thread. Unless otherwise specified, the color shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 - Coyote 498, Class 4 - Arctic White 488, Class 5 - Tan 499 and shall meet the requirements in Table III through X. Thread shall conform to the following requirements.

3.12.8.1 Thread. The nylon thread shall conform to A-A-59826 Type II Class A Size F.

3.12.8.2 Thread. The nylon thread shall conform to A-A-59826 Type II Class A Size E.

3.12.8.3 Thread. The nylon thread shall conform to A-A-59826 Type II Class A Size FF.

3.12.9 Fastener, slide. Slide fasteners shall conform to the following requirements.

3.12.9.1 Fastener, slide. The slide fastener shall be chain #5 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. The tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.9.2 Fastener, slide. The slide fastener shall be #5 continuous element coil, closed on both sides, with a single slider. The tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fasteners shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.9.3 Fastener, slide. The slide fastener shall be chain #10 individual element molded plastic, separating, with a double-pull reversible slider. The slide fastener shall be YKK P/N Vislon #10 or equivalent. The color shall be Black.

3.12.9.4 Fastener, slide. The slide fastener shall be chain #10 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. The 0.75 inch tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Black.

3.12.9.5 Fastener, slide. The water-resistant slide fastener shall be chain #10 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fasteners shall be YKK P/N Uretek coil #10 with 0.75 inch matte black tape or equivalent. The color shall be Black.

3.12.9.6 Fastener, slide. The slide fastener shall be chain #8 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. The 0.625 inch tape shall have a

water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Black.

3.12.9.7 Fastener, slide. The slide fastener shall be #8 continuous element coil, closed on both sides, with a single slider. The 0.625 inch tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 6. The color shall be Black.

3.12.9.8 Fastener, slide. The water-resistant slide fastener shall be chain #10 continuous element coil, closed on both sides, with two sliders in mouth-to-mouth configuration. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall be YKK P/N Uretek coil #10 with 0.75 inch matte black tape or equivalent. The color shall be Black.

3.12.9.9 Fastener, slide. The water-resistant slide fastener shall be chain #8 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall be YKK P/N Uretek coil #8 with 0.625 inch matte black tape or equivalent. The color shall be Black.

3.12.9.10 Fastener, slide. The slide fastener shall be chain #10 continuous element coil, closed on both sides, with a single slider. The slide fastener shall conform to A-A-55634, Type 1, Style 6. The color shall be Coyote 498.

3.12.9.11 Fastener, slide. The slide fastener shall be chain #8 continuous element coil, closed on both sides, with two double-pull reversible sliders in throat-to-throat configuration. The 0.625 inch tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.9.12 Fastener, slide. The slide fastener shall be chain #8 continuous element coil, closed on both sides, with a single slider. The 0.625 inch tape shall have a water repellent treatment. A round cord thong shall be used in place of a pull on the slider body (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.



3.12.9.13 Fastener, slide. The slide fastener shall be chain #8 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. The 0.625 inch tape shall have a water repellant treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.9.14 Fastener, slide. The slide fastener shall be chain #10 continuous element coil, closed on both sides, with two sliders in throat-to-throat configuration. The 0.75 inch tape shall have a water repellant treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.9.15 Fastener, slide. The slide fastener shall be chain #8 continuous element coil, closed on both sides, with two sliders in mouth-to-mouth configuration. The 0.625 inch tape shall have a water repellant treatment. A round cord thong shall be used in place of a pull on the slider bodies (see paragraph 3.12.10.3). The two ends of the cord shall be seared and tightly tied together using an overhand knot. The finished length of the thong shall measure 2.0 inches  $\pm$  0.25. The slide fastener shall conform to A-A-55634, Type 1, Style 18. The color shall be Coyote 498.

3.12.10 Cord. Unless otherwise specified, the color shall be: Class 1 - Coyote 498, Class 2 - Coyote 498, Class 3 - Coyote 498, Class 4 - Arctic White 488, Class 5 - Tan 499 and shall meet the requirements in Table III through X. Cord shall conform to the following requirements.

3.12.10.1 Braid, tubular. The 11/32 inch tubular braid shall conform to MIL-B-371 Type VII Class 2.

3.12.10.2 Cord, elastic. The 0.125 inch elastic cord shall be Hope Webbing style 2831 round or equivalent.

3.12.10.3 Cord, round. The round cord shall conform to MIL-C-5040 Type II. This specification is inactive; however, for the purposes of this document the specification remains applicable.

3.12.10.4 Cord, flat. The flat cord shall conform to MIL-C-5040 Type IIA. This specification is inactive; however, for the purposes of this document the specification remains applicable.

3.13 Hook and loop fastener. Hook and loop fasteners shall not be stitched in the selvage edge to prevent fraying and associated durability problems with repeated use. If Class 4 is used, the hook and loop fasteners shall be stitched 0.125 inch from the edge.

3.14 Matching, webbing. The color of the webbing shall match the solid shade shell standard sample when viewed under filtered tungsten lamp which approximates artificial daylight having a correlated color temperature of  $7500 \pm 200$  K, with illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200$  K.

3.15 Stitching. Stitching shall conform to ASTM D-6193, 9-11 stitches per inch. End of seams and stitches (stitch type 301) that are not caught in other seams or stitching shall be securely bartacked or backstitched. Thread breaks or bobbin run-outs occurring during sewing shall be secured by stitching back of the break minimum of 0.5 inch. There shall be no stitch run-off allowed. Thread tension shall be maintained so that there will be no loose stitching resulting in loose bobbin or top thread, or excessively tight stitching resulting in puckering of the materials being sewn. Thread ends shall be trimmed to a length of not more than 0.25 inch.

3.16 Automatic Stitching. Automatic stitching machines may be used to perform any of the stitching patterns provided the requirements for the stitch pattern, stitches per inch, 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.

3.17 Bartacks. There shall be no needle cutting by bartack. Double bartacks (one on top of the other) shall be avoided to prevent needle cutting and weakening of the attachment point.

3.18 Bartack Alignment for Pouch Attachment Ladder System. The required spacing of vertical bartacks which is needed for physical compatibility of PALS components on FILBE is specified below:

- A) Distance between vertical bartacks on horizontal webbing shall be 1.5 inch - 0 / + 0.0625.
- B) Distance between non-consecutive horizontal webbing shall be 1.125 inch  $\pm$  0.0625.
- C) Vertical bartacks on consecutive horizontal webbing rows shall be vertical aligned with an offset of 0.75 inch - 0 / + 0.0625 bottom to top in a vertical straight line.

3.19 Buttonholes. Buttonholes shall be straight cut. Position in accordance with the marks indicated on the pattern, with the ends of the buttonholes securely tacked. Size as indicated on drawings.

3.20 Snap Setting. A hole shall be pre-punched to receive the button and eyelet components of the snap fastener. The hole shall be smaller than the outside diameter of the button and eyelet barrels. The fastener shall be securely clinched without cutting the adjacent materials, and no splits shall occur in the button or eyelet barrels.

3.21 Snap Fastener Reinforcement. Snap fastener reinforcement that will not ravel is required on any single fabric layer application.

3.22 Binding. All ends of binding not completely encased are to be seared.

3.23 Drainage. Components of the FILBE shall provide a durable means of allowing water to drain out.

3.24 Quick Release Mechanism. The shoulder straps shall have a quick release mechanism. The activator shall be located on the upper portion of the shoulder strap within 4.0 inches of the release buckle and be capable of being activated by either hand, with or without gloves on. Upon activation of the mechanism, the shoulder strap shall separate, allowing the pack system to fall away from the body.

3.25 Identification and Instruction Label. Each component of the FILBE shall have an identification and instruction label (exceptions noted) conforming to MIL-DTL-32075. Labels shall be readable under low light conditions; moonlight and red or blue filtered flashlight. The label shall be permanently affixed (i.e. sewn). The label shall be of sufficient strength to withstand repeated abrasion during field use and cleaning. The color of the label shall be Coyote 498 and the marking medium shall be black. The printing shall be legible and shall not show off-setting, smearing or bleeding. All printing shall be in capitals except where otherwise indicated on the instruction label. Size of the characters shall be in accordance with MIL-STD-130N paragraph 4.3b. The identification portion of the label shall contain item description, National Stock Number (NSN), contract number, lot number and contractor's name.

3.26 Responsibility for Compliance. All items shall meet all requirements of Section 3 and 4 of this specification. The absence of any inspection requirements shall not relieve the contractor of the responsibility of ensuring that all items submitted to the government for acceptance shall 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. If there is a conflict between the stated requirements and the ANSI standard, the more restrictive requirement shall apply.

3.27 Physical Requirements of Cloth.

3.27.1 Matching. The color of the finished cloth shall match the standard sample when viewed under filtered tungsten lamps and approximate artificial daylight and that has a correlated color temperature of  $7500 \pm 200$  K, with illumination of  $100 \pm 20$  foot-candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200$  K.

3.27.2 Colorfastness.

3.27.2.1 Colorfastness, Coyote 498. The dyed and printed finished cloth in Coyote 498 shall meet the following colorfastness requirements when tested in accordance with paragraph 4.6.6 for the characteristics listed below.

**Table II. Colorfastness Examination**

<b>Colorfastness Characteristics</b>	<b>Requirements</b>
Fastness to laundering (after 3 launderings)	Equal to or better than "3-4" rating on AATCC Gray Scale for Color Change and Staining when compared to the unlaundered sample.
Fastness to Accelerated laundering	Equal to or better than "3-4" rating on

(black print only)	AATCC Gray Scale for Color Change when compared to the unlaundered sample
Fastness to light (after 40 hours)	Equal to or better than "3-4" rating on ATCC Gray Scale for Color Change.
Fastness to Crocking	Equal to or better than "3-4" rating on AATCC Gray Scale for Staining.
Blocking Rating	Number 2 maximum rating.
Frosting Rating	Equal to or better than "4.0" rating on AATCC Gray Scale for Color Change.

3.27.2.2 Colorfastness, Woodland MARPAT. The finished camouflage printed cloth shall show fastness to: light (after 40 AATCC standard fading hours or 170 Kilojoules); laundering (after 3 cycles); and perspiration (acid and alkaline). The colorfastness of the cloth shall be equal to or better than the standard sample, or equal to or better than a rating of “4” using the AATCC Gray Scale for Color Change and a rating of “3-4” using the AATCC Gray Scale for Staining for each of the colors. The finished cloth shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale Rating not lower than 4.0 for all the colors.

3.27.2.3 Colorfastness, Desert MARPAT. The finished camouflage printed cloth shall show fastness to: light (after 40 AATCC standard fading hours or 170 Kilojoules); laundering (after 3 cycles); and perspiration (acid and alkaline). The colorfastness of the cloth shall be equal to or better than the standard sample, or equal to or better than a rating of “4” using the AATCC Gray Scale for Color Change and a rating of “3-4” using the AATCC Gray Scale for Staining for each of the colors. The finished cloth shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale Rating not lower than 4.0 for all the colors.

3.27.2.4 Colorfastness, Snow MARPAT. The finished camouflage printed cloth shall show fastness to: light (after 40 AATCC standard fading hours or 170 Kilojoules); laundering (after 4 cycles); and perspiration (acid and alkaline) and crocking. The colorfastness of the cloth shall be equal to or better than the standard sample, or equal to or better than a rating of “4” using the AATCC Gray Scale for Color Change and a rating of “3-4” using the AATCC Gray Scale for Staining for each of the colors. The finished cloth shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale Rating not lower than 4.0 for all the colors.

3.27.3 Spectral Reflectance. The finished cloth shall meet the spectral reflectance values (in percent) for the visible/near infrared wavelength range, 600 to 860 nanometers (nm) (700 to 860 nanometers for Desert MARPAT) for the colors specified in Tables III through X as applicable when tested as specified in paragraph 4.7.1.

**Table III. Infrared Spectral Reflectance Requirements for Coyote 498**

WAVELENGTH (nm)	REFLECTANCE (%)	
	Min	Max
600	8	20
620	8	20
640	8	22
660	8	24
680	12	24
700	12	34
720	16	42
740	22	46
760	30	50
780	34	54
800	36	56
820	38	58
840	38	58
860	40	60

**Table IV. Infrared Spectral Reflectance Requirements for Woodland MARPAT**

WAVELENGTH (nm)	REFLECTANCE (%)					
	Coyote 476		Green 474 & Khaki 475		Black 477	
	Min	Max	Min	Max	Min	Max
600	8	20	3	9	---	---
620	8	20	4	9	---	---
640	8	20	5	9	---	---
660	8	20	6	12	---	---
680	10	30	7	14	---	---
700	18	50	8	28	---	20
720	22	54	9	44	---	30
740	30	56	10	52	---	33
760	35	58	11	56	---	33
780	40	62	12	56	---	34
800	55	80	13	56	---	34
820	55	80	14	60	---	35
840	55	82	15	60	---	35
860	60	82	16	60	---	35

**Table V. Infrared Spectral Reflectance Requirements for Snow MARPAT**

WAVELENGTH (nm)	REFLECTANCE (%)					
	White Snow 506		Light Snow Gray 507		Medium Snow Gray 508	
	Min	Max	Min	Max	Min	Max
600	80	98	46	66	28	36
620	80	98	47	66	30	40
640	78	98	48	66	30	44
660	78	98	49	68	34	44
680	78	98	50	72	36	48
700	78	98	51	72	40	56
720	78	98	52	72	40	56
740	78	98	53	72	42	56
760	78	98	54	72	44	56
780	78	98	55	74	46	58
800	78	98	56	74	46	60
820	78	98	57	76	48	64
840	76	99	58	76	48	66
860	76	99	59	76	50	66

**Table VI. Infrared Spectral Reflectance Requirements for Desert MARPAT**

WAVELENGTH (nm)	REFLECTANCE (%)					
	Lt. Tan 479		Lt. Coyote 481 Highland 480		Urban Tan 478	
	Min	Max	Min	Max	Min	Max
700	38	53	19	36	25	48
720	38	58	20	36	25	52
740	39	62	20	36	25	54
760	40	66	21	36	26	56
780	41	72	21	38	27	57
800	43	76	22	43	28	58
820	45	76	23	45	30	58
840	48	78	24	46	33	58
860	50	78	25	46	36	59

**Table VII. Infrared Spectral Reflectance Requirements for OCP**

WAVELENGTH (nm)	REFLECTANCE (%)					
	Cream 524 Tan 525		Pale Green 526 Olive 527 Brown 529		Dark Green 528 Dark Brown 530	
	Min	Max	Min	Max	Min	Max
600	22	44	10	30	3	12
620	24	45	11	30	3	12
640	24	45	11	32	4	12
660	25	45	12	32	4	13
680	28	48	14	35	4	18
700	28	54	19	40	6	25
720	30	58	22	43	6	27
740	32	60	25	46	10	29
760	36	61	27	48	14	33
780	38	62	28	50	18	36
800	40	62	29	50	20	37
820	44	65	30	51	20	38
840	46	66	32	51	21	39
860	48	67	33	52	21	40

**Table VIII. Infrared Spectral Reflectance Requirements for Foliage Green 504**

WAVELENGTH (nm)	REFLECTANCE (%)	
	Min	Max
600	8	18
620	8	18
640	8	20
660	10	26
680	10	26
700	12	28
720	16	30
740	16	30
760	18	32
780	18	34
800	20	36
820	22	38
840	24	40
860	26	42

**Table IX. Infrared Spectral Reflectance Requirements for Foliage Green 504 Acetal Hardware**

WAVELENGTH (nm)	REFLECTANCE (%)	
	Min	Max
600	8	18
620	8	18
640	8	18
660	10	26
680	10	26
700	12	28
720	20	36
740	26	40
760	30	52
780	32	56
800	32	60
820	34	60
840	36	60
860	36	60

**Table X. Infrared Spectral Reflectance Requirements for Black 357**

WAVELENGTH (nm)	REFLECTANCE (%)
	Max
700	20
720	30
740	33
760	33
780	34
800	34
820	35
840	35
860	35

3.27.3.1 Spectral Reflectance Exemptions. The following components are exempt from meeting Infrared Spectral Reflectance Requirements: Any components made from food-grade materials where the impact of IR treatment may affect compliance to either US FDA requirements or European equivalent. These include the bladder material and fitments, hydration tube, tube connectors, bite valve, and bite valve cover.

3.28 Interface requirements. The FILBE shall be compatible with the clothing and equipment commonly worn, carried and used by the individual Marine, to include body armor systems and ballistic helmets. All components of the system shall be compatible with each other. Integration of the components shall be accomplished with minimum use of straps/belts or hardware.



3.29 Pouch Attachment. The Pouch Attachment Ladder System (PALS) shall be used to attach modular pouches to the specified components of the FILBE. This system is a patented design and is not allowed for commercial sale without a license. There are no restrictions on the sale of this system under signed contracts with federal agencies.

### 3.30 Performance.

3.30.1 Function. Components of FILBE shall be easily and quickly donned and doffed. When in use, the entire system or individual components shall not impede proper head rotation of the user while standing or in a prone position, or carrying and shouldering of weapons in all firing positions.

### 3.30.2 Durability.

3.30.2.1 Durability, USMC Pack. The Main Pack (see paragraph 1.3) shall be capable of withstanding a Free Fall Drop test in accordance with paragraph 4.6.5.2 and an Airdrop Slide Impact test in accordance with paragraph 4.6.5.1. There shall be no rupture of seams or visual damage to the frame, fabric or components. Two separate sample units shall be used for the Free Fall Drop test and Airdrop Slide Impact test. Verification tests may be performed by the Government.

3.30.3 Environment. The FILBE will be used in all climatic categories during day and night operations. Hardware shall provide for a secure connection of the components and operation of hardware shall be easily operable when wearing heavy gloves and while operating during periods of darkness.

## 4. VERIFICATION

4.1 Classification of Inspections. The inspection requirements specified herein are classified as outlined below. Unless otherwise specified, the contractor is responsible for the performance of all inspection requirements specified herein. The Government reserves the right to perform any of the inspections set forth in this document where such inspections are deemed necessary to ensure the supplies conform to prescribed requirements.

A) First Article Test (see paragraph 4.2)

B) Quality Conformance Inspection (see paragraph 4.3)

4.2 First Article Test. When a First Article Test is required, it shall be examined for design (paragraph 3.3), compatibility and interchangeability of components, inspection requirements (paragraph 4.5), data, certificate or compliance for testing requirements (paragraphs 4.6 and 4.7), and overall workmanship. The procuring activity may waive any test(s) when sufficient documentation already exists to verify compliance. This is encouraged in cases when additional models, or minor changes from the currently approved model, are to be verified. In these cases, only the applicable portions of the First Article Test will be conducted.

4.2.1 Material and Component Qualification. At any point after a First Article Test has been approved, any desired material or component change(s) must be submitted to the Government via an Engineering Change Proposal (ECP) and shall be subject to testing in accordance with the appropriate paragraph of this document. Changes to any material or component approved through First Article Testing must be approved in writing by the Government prior to presentation for inspection and acceptance.

4.3 Quality Conformance Inspection. Unless otherwise specified, at a minimum, the contractor's quality plan shall be performed in accordance with ANSI/ASQC Z1.4 General Inspection Level II and an AQL of 2.5 for majors and an AQL of 4.0 for minors. The lot size shall be expressed in units of complete systems or individual components (when components are purchased separately). A sample unit shall be one system. Quality Conformance Inspection in accordance with paragraphs 4.3.1, 4.5, 4.6.

4.3.1 Compatibility. The FILBE shall be examined to verify compatibility between components (attaching/detaching).

4.4 Certificate of Compliance. Certificates of Compliance (CoC) shall be provided when requested by the Government. The Government reserves the right to inspect any item to determine the validity of the certification.

4.5 Demonstration Verification. The performance requirement is verified by observation and operation that the properties, characteristics and parameters of the item meet the functional requirements specified in applicable paragraphs of Section 3. Pass or fail criteria are simple accept or reject indications of functional performance since no qualitative values exist or are difficult to measure.

4.6 Requirements and Verifications. The following are performance requirements verified through visual methods, including physical measurements in order to determine that no deficiencies exist.

4.6.1 End Item Visual Inspection. The end items shall be inspected for the defects listed in Table XI and Table XII. The lot size shall be expressed in units of complete systems, or individual components (when components are purchased separately). A sample unit shall be one complete system or individual component. The number of sample units selected for sampling will be dictated by the inspection level.

**Table XI. End Item Visual Examination**

EXAMINE	DEFECT	CLASSIFICATION	
		MAJOR	MINOR
Fabric	Hole, cut, tear, smash, broken or missing yarn, or open place clearly visible at normal inspection distance (approximately 3 feet).	101	
	Shade bar or abrasion mark.		201
	Defective or partially omitted coating		202
Webbing or Tape	Any hole, cut, tears, or smash.	102	
	Not firmly and tightly woven, edges frayed or scalloped.	103	
	Multiple floats		203
	Abrasion mark, slub, or broken end or pick.	104	
	Cut ends of webbing not fused as specified.	105	
Fastener Tape	Any hole, cut, or tear.	106	
	Hooks flattened, broken, or missing. Impairing function.	107	
Hardware	Broken or malformed, failing to serve intended purpose, corroded area, burr or sharp edge.	108	
	Finish omitted, not as specified, or area of partial or no finish.	110	
	Any required component improperly installed causing failure to serve intended purpose.	111	
	Not assembled as specified.	112	
	Size or type not as specified.		205
Snap fasteners	Any fastener not functioning properly. (i.e. fails to snap closed, provide a secure closure, or to open freely.)  NOTE: The fasteners shall be snapped and un-snapped twice to determine whether parts of fastener separate freely; and also affect a secure closure.	113	
	Clinched excessively tight, cutting adjacent material.	114	
	Clinched loosely, permitting any component to rotate freely but not to the degree that any component can be expected to become detached during use.		206
	Clinched loosely to the degree that components can be expected to become detached during use.  NOTE: Incomplete roll of end of button or eyelet barrel is evidence of improper and insecure clinching.	115	
	Incorrect style.	116	
	Any splits in eyelet or button barrels.		207

Drawstrings	Cut, chafed, or abraded.	117	
	Ends not fused.		208
	Not threaded through grommets or knotted as specified.		209
	Omitted.	118	
Barrel lock	Not as specified.		210
Sub-assemblies	Not attached as specified.		211
Brass grommets and eyelets	Clinched excessively tight, cutting adjacent material.	119	
	Insecurely clinched to a degree that grommet or eyelet may be detached from material.	120	
	Washer installed on incorrect side of material.		212
	Eyelet barrel split.		213
Slide fastener	Not functioning properly, failing to effect a secure closure or to open freely.	121	
	Not specified type or size.		214
	Slider jams or fails to interlock.	122	
	Thong omitted (if applicable).	123	
	Fastener tape cut or torn.	124	
<b>SEAMS AND STITCHING:</b>			
Open seam	1/2 Inch or less.		215
	More than 1/2 inch. NOTE: A seam shall be classified as open when one or more stitches joining a seam are broken or when two or more consecutive skipped or run-off stitches occur. On double stitched seams, a seam shall be considered open when either one or both sides of the seam are open.	125	
Raw edge (on edge required to be finished)	More than 1/2 inch when securely caught in stitching. NOTE: Raw edge not securely caught in stitching shall be classified as an open seam.		216
Run-off (see open seam)			
Seam and stitch type	Wrong seam or stitch type.	126	
Bartacks	Any bartack omitted.	127	
	Any bartack not as specified or not in specified location.		217
	Loose stitching, incomplete or broken.		218
Stitch tension	Loose, resulting in loose bobbin or top thread.		219
	Excessively tight, resulting in puckering of material.		220
Stitches per inch	Up to two stitches less than minimum specified.		221
	Three or more stitches less than minimum	128	

	specified.		
	One or more stitches in excess of maximum specified. NOTE: Variation in the number of stitches per inch caused by the operator speeding up the machine and pulling the fabric in order to sew over heavy seams, or in turning corner shall be classified as follows: (a) Within the minor defect classification no defect. (b) Within the major defect classification minor defect.		222
Stitching ends	Not secured as specified.		223
Thread breaks, skipped stitches, or run-offs	Not overstitched as specified. NOTE: Thread breaks or two or more consecutive skipped or run-off stitches not overstitched shall be classified as open seams.		224
Rows of stitching	Any row missing except on box, and box-x stitching.	129	
	On box, and box-x stitching: - one row of stitching omitted. - two or more rows of stitching omitted.	130	225
Component and assembly	Any component part omitted or not as specified or any operation omitted or not as specified (unless otherwise classified herein).	131	
	Needle chews.	132	
	Any mend, darn, patch, splice or other unauthorized repair.	133	
	Any material pleated or caught in stitching where not specified.		226
Plastic frame; Stiffener or Film	Chip, cut, crack, splinter, broken end or space, failing to serve intended purpose.	134	
Binding	Loosely applied but not exposing raw edge of material.		227
	Loosely applied exposing raw edge of material.	135	
	Ends of binding on pocket flap and on ammunition pockets not caught in seams.		228
	Ends of binding on pocket flap and on grenade pockets not caught in seams.		229
Darts (on pouch pocket flaps)	Not formed and sewn separately on pouch pocket flap as specified	136	
	One or more omitted.		230
Ammunition and	Flaps improperly set or distorted failing to affect a	137	

grenade pocket and flap	full and smooth closure.		
	Pocket or flap not formed as specified.		231
	Binding tape not securely attached.		232
Cleanness	Grease, oil, dirt or ink stains clearly noticeable.		233
	Thread ends not trimmed as specified.		234
Location markings	Drilled or Permanent	138	
	Printed marking more than 1/32 inch in width or not covered by component part.		235
Markings: Identification and instructions	Omitted, incorrect, illegible, or misplaced, or size of characters not as specified.		236
Manual and Checklist	Omitted, incorrect, illegible.		237

4.6.3 Dimensional Examination. The completed systems or individual components shall be examined for the defects listed below. A sample unit shall be one complete system or individual component. The number of sample units selected for sampling will be dictated by the inspection level.

**Table XII. End Item Dimensional Examination**

EXAMINE	DEFECT	CLASSIFICATION	
		MAJOR	MINOR
Dimensions (overall)	Smaller than nominal dimensions and applicable minus tolerance indicated on drawings.	139	
	Larger than nominal dimensions and applicable plus tolerance.	140	
Component and location dimensions	Not within specified tolerance.		238
Stitch margin or gage	Not within specified tolerance.		239
Box, box-x and stitching	Dimensions not within specified tolerance.		240
Brass eyelets	Not spaced on equipment within specified dimensions.		241
Grommets	Set off center on hems by more than 0.25 inch.	141	

4.6.4 End Item Fit Examination. The completed systems or individual components shall be examined for the defects listed below. A sample unit shall be one complete system or individual component. The number of sample units selected for sampling will be dictated by the inspection level. The gauges used to determine proper fit of the magazine clips and the grenades, if applicable, shall be furnished by the Government. The gauges shall be constructed in accordance with drawings 2-1-2242, 2-1-2243, 2-6-110 and 2-6-111 through 2-6-114.

**Table XIII. End Item Fit Examination**

EXAMINE	DEFECT	CLASSIFICATION	
		MAJOR	MINOR
Gauge fit into pocket/ pouches & closure of flaps	Failure of gauge to fit properly within pocket/pouches without excessive force. Inability to completely close flap down in order to secure the fastener without applying excessive force.	142	

4.6.4.1 Thirty (30) Round M4/M16 Magazine Pouch. Two M4/M16 magazine gauges shall be inserted into the appropriate magazine pouches. The open ends of the gauges shall face down with the outline of the ammunition at the closed end and be able to be orientated to either the left or right. The gauges shall be inserted into the pouch without effort other than that necessary to overcome reasonable friction between the gauges and the pocket. A defect shall be scored if any gauge must be forced into the pocket. With the gauge(s) in the pocket, the pocket flap shall be closed and the fastener(s) secured. A defect shall be scored if the pocket body or the flap is too short causing inability to secure the fastener without applying excessive force to the flap to secure the fastener(s).

4.6.4.2 9mm Magazine Fit. A 9mm magazine gauge shall be inserted into the 9mm magazine speed reload pouch. The top flap shall be in the speed reload position and the pouch inverted. The pouch shall retain the magazine without any slippage. A defect shall be scored if the pouch does not fully retain the magazine gauge when inverted.

4.6.4.3 SINCGARS/ASIP Radio Fit. A SINCGARS gauge measuring 10.75 x 14.5 x 3.5 inches shall be inserted lengthwise into the radio pouch to determine proper fit of the radio. The ASIP gauge shall measure 5.375 x 3.375 x 10 inches. The gauges shall be fully inserted within each pouch without effort other than that necessary to overcome reasonable friction between the gauge and the pouch. A defect shall be scored if the gauge fails to fit properly within the pouch.

4.6.4.3 Grenade Fit. An M67 grenade gauge shall be inserted into the pouch with the safety pin on top. The gauge shall be fully inserted within each pouch without effort other than that necessary to overcome reasonable friction between the gauge and the pouch. A defect shall be scored if the gauge must be forced into the pouch.

4.6.4.4 Shotgun Shell Fit. A 12-gauge shotgun shell or dummy round shall be inserted into each of the elastic loops. Each shell or dummy round shall be cylindrical in shape measuring  $51/64 \pm 1/64$  inches in diameter and  $2 \frac{13}{32} \pm 1/32$  inches long. The shell or dummy round must be fully inserted within each loop without effort other than that necessary to overcome reasonable friction between the shell or dummy round and the elastic webbing. The loaded panel shall be shaken three times in a sharp downward motion. If any shotgun shell or dummy rounds come loose, a defect shall be scored.

4.6.4.5 40mm High Explosive/Pyrotechnic Grenade Fit. The gauge shall be inserted into each high explosive grenade pouch. The flat ends of the fit gauges shall face towards the tab/flap of

the pouch. A defect shall be scored if the gauge must be forced into the pouch.

4.6.4.6 Utility/Squad Automatic Weapon Pouch. A wooden gauge measuring 5 9/16 inch x 4 5/8 inch x 2 5/8 inch that represents a 100 round linked ammunition box shall be inserted lengthwise into the Utility/Squad Automatic Weapon (SAW) pouch to determine proper fit. The gauge shall be fully inserted within each pouch without effort other than that necessary to overcome reasonable friction between the gauge and the pouch. A defect shall be scored if box fails to fit properly within the pouch. A wooden block 7 3/4 inch x 6 1/2 inch x 3 1/8 inch representing a 200 round SAW drum shall be inserted lengthwise into the pouch to determine proper fit. The gauge shall be fully inserted within each pouch without effort other than that necessary to overcome reasonable friction between the gauge and the pouch. A defect shall be scored if the drum fails to fit.

4.6.4.7 Ground Illumination Flare Single (Pop Up) Pouch. The pouch shall have a single closure device and securely contain one (1) ground illumination flare. The pouch shall contain the device with the cap facing up.

4.6.4.8 Thirty (30) Round M16/M4 Speed Reload Pouch Fit. The Speed Reload Pouch shall allow easy accessibility in order to provide the user their first choice for reloading. The magazine shall have adequate retention in the pouch without the use of a closure device and must be able to remain in the pouch without the use of the closure device during normal combat operations. The pouch shall have a single closure device that can be undone with one hand and shall not interfere with the quick reload capability. The pouch shall allow the magazine to be placed in the pouch with the rounds facing to either the left or right.

4.6.4.9 Magazine "Dump" Pouch. The pouch shall be able to contain eight (8) empty M16/M4 magazines and have a closure device. The pouch shall be adjustable by two inches in the vertical direction and compatible with the martial arts belt and PALS webbing.

4.6.4.10 Multi-Grenade Pouch. The pouch shall use a single closure device to keep the contents of the pouch secure until such time as the user desires. Neither the spoon nor safety pin shall protrude from the pouch. When not carrying a smoke grenade the pouch shall be able to hold at least one (1) flash bang.

4.6.5 End Item Testing.

4.6.5.1 Airdrop Slide Impact Test. The Main Pack (see paragraph 1.3) shall be uniformly loaded with sand bags and cloth ballast to a capacity of 120 pounds. The loaded pack shall be slid down a wire at 45 degrees from vertical and reach a final velocity of 31 to 34 feet per second upon impacting the surface. The test shall be conducted three (3) times with impact on the frame and an additional three (3) times with impact on the main pack. Both slide impact tests shall be conducted on asphalt or concrete surfaces. There shall be no rupture of seams or visual damage to the frame, fabric or components. The sample unit shall be one (1) Main Pack (see paragraph 1.3).

4.6.5.2 Free Fall Drop Test. The Main Pack (see paragraph 1.3) shall be uniformly loaded with



sand bags and cloth ballast to a capacity of 120 pounds. From a height of 10 feet, the loaded pack shall be dropped three (3) times with impact on the frame. The same sample unit shall be dropped from a height of 10 feet an additional three (3) times with impact on the main bag. Both drop tests shall be conducted on asphalt or concrete surfaces. There shall be no rupture of seams or visual damage to the frame, fabric or components. The sample unit shall be one (1) Main Pack (see paragraph 1.3).

4.6.6 Material Tests. The finished cloth and thread shall be tested for the characteristics listed in Table XIV.

**Table XIV. Material Tests**

<b>Characteristic</b>	<b>Test Method</b>
Fabric	
Textured Nylon	
Weight	ASTM D 3776
Breaking strength	ASTM D 5034
Water repellency	AATCC METHODS
Colorfastness to:	
Laundering, after 3 cycles	AATCC METHOD 61-1994
Laundering (accelerated black print only)	AATCC METHOD 61-1994
Light	AATCC METHOD 16-1993
Crocking	AATCC METHOD 8-1989
Resistance to frosting, for carbon black	AATCC METHOD 119 /1/
Infrared reflectance	
Matching standard sample	Visual
Spray rating	ATCC-22 Direct Transfer
Hydrostatic resistance	ATCC-127
Thread	
Breaking strength	ASTM D 2207
Water repellency	ASTM D 2207 /2/
Webbing and Tape	
1 inch webbing	
Weight	ASTM D 3776
Breaking strength	/3/
Fastness to:	
Laundering	AATCC 61-1994 /4/
Light	AATCC 16-1993 /5/
Crocking	AATCC 8-1989
1 inch elastic webbing	
Weight	ASTM D-3776
Load range	/3/
Tension set	/3/
Fastness to:	

Laundering	AATCC 61-1994 /4/
Light	AATCC 16-1993 /5/
Crocking	AATCC 8-1989
1.5 inch webbing	
Weight	ASTM D-3776
Breaking strength	/3/
Fastness to:	
Laundering	AATCC 61-1994 /4/
Light	AATCC 16-1993 /5/
Crocking	AATCC 8-1989
Spectral reflectance	
2 inch webbing	
Weight	ASTM D-3776
Breaking strength	/3/
Fastness to:	
Laundering	AATCC 61-1994 /4/
Light	AATCC 16-1993 /5/
Crocking	AATCC 8-1989
Spectral reflectance	
Tape, binding	
Weight	ASTM D-3776
Breaking strength	/3/
Fastness to:	
Laundering	AATCC 61-1994 /4/
Light	AATCC 16-1993 /5/

/1/ Except that the number of abrasion cycles shall be 300.

/2/ Single strand method.

/3/ As specified in contract.

/4/ Use Test 1A, Table I with the following changes: temperature = 100° + 4<sup>0</sup>F, total liquid volume = 100 ml, time = 30 minutes.

/5/ Use option "A".

4.7 Spectral Reflectance Measurements in the Visible/Near Infrared. Spectral reflectance data shall be obtained from 700 to 860 nanometers (nm) at 20 nm intervals for Desert MARPAT and 600 to 860 nanometers (nm) at 20 nm intervals for all other classes, on a spectrophotometer (see paragraph 6.3) relative to a barium sulfate standard, the preferred white reference standard. Other white reference materials may be used, provided they are calibrated to absolute white; e.g., Halon, magnesium oxide, or vitrolite tiles (see paragraph 6.4). Reflectance measurements may be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a source that simulates either CIE Source A or CIE Source D65. Measurements will be taken on a minimum of two (2) different areas and the data averaged. The measured areas should be at least 6.0 inches away from the selvage. The specimen shall be measured as a single layer backed with layers of the same fabric and shade as follows: Class 1, Coyote 498, three (3) backing layers shall be used; Class 2, Woodland MARPAT, four (4)

backing layers for Green 474, Khaki 475 and Coyote 476 and two (2) backing layers for Black 477; Class 3, Desert MARPAT, four (4) backing layers of the same shade; Class 4, Snow MARPAT, six (6) backing layers of the same shade; Class 5, Universal Camouflage Pattern, four (4) backing layers of the same shade. Loop fastener tape shall be measured as a single layer. The specimen shall be viewed at an angle not greater than 10 degrees from normal with the specular component included. Photometric accuracy of the spectrophotometer shall be within 1 percent and wavelength accuracy within 2.0 nm. The standard aperture size used in the color measurement device shall be 1.0 to 1.25 inches in diameter for Class 1 - Coyote 498 and 0.3725 inches or larger for Class 2 - Woodland MARPAT, Class 3 - Desert MARPAT, Class 4 - Snow MARPAT and Class 5 - Universal Camouflage Pattern. When the measured reflectance values for any color at four or more wavelengths do not meet the limits specified in Table III through X it shall be a test failure.

4.8 Determination of Fluorescence. One sample of cloth and one specimen from the standard sample shall be compared under ultraviolet light in an otherwise completely dark room. The specimen shall be considered satisfactory if its hue of fluorescence is the same as the standard sample. The result shall be reported as "pass" or "fail".

4.9 Verification Tests. Verification field tests may be conducted to verify requirements in Section 3 for which standard test methods are not available. The following requirements shall be verified:

- A) Compatibility with clothing and equipment.
- B) Compatible with individual airborne equipment items and rigging procedures.
- C) Individual components - Not impede head rotation while standing or in prone position.
- D) Individual components - Not impede shouldering or firing weapons in all firing position.
- E) Ease of attaching/detaching components.
- F) Secure connection of components to body armor vests and frame.
- G) Durability of thread/stitching and fabric.
- H) Easily field repairable.
- I) Carry varied combat loads through multiple mission profiles.
- J) Fit 5<sup>th</sup> percentile female Marine through the 95<sup>th</sup> percentile male Marine population.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order.

## 6. NOTES

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

6.1 Intended Use. The FILBE is intended for use by Marines for man-transportation of mission essential items.

6.2 Standard Samples, Specifications/Drawings and Pattern Drawings. For access to the standard samples of finished fabrics, address the contracting activity issuing the invitation for bids or request for proposal.

6.3 Spectrophotometers. Suitable spectrophotometers for measuring spectral reflectance in the visible/near-infrared are the Diano Hardy, Diano Match Scan, Hunter D54-IR, Hunter VIS/NIR spectrophotometer and Macbeth 1500 with IR option.

6.4 Source of Material. Barium sulfate of suitable quality for use as white standard is available from Eastman Kodak Co. The same source has available magnesium reagent (ribbon) and Halo. Suitable tiles can be obtained from the National Bureau of Standards or from the instrument manufacturers.

6.5 Water Repellency. Approval of such compounds and combinations is the responsibility of the U.S. Army Natick Soldier Systems Center, Natick, MA 01760-5014, and is based on more extensive tests, including those for toxicity, which are not set forth in this document. Because of the time necessary to conduct full evaluation (approximately 6 months), only those chemical treatments already approved and so listed in the invitation for bids or request for proposal shall be considered acceptable for the related procurement.