INCH-POUND

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PURCHASE DESCRIPTION

SLEEPING BAG SYSTEM, MODULAR

1. SCOPE. This purchase description covers a modular sleeping bag system that consists of a patrol sleeping bag, an intermediate cold weather sleeping bag, a waterproof bivy cover and two compression stuff sacks to carry the components of the system. This system is constructed to insulate the user in environments ranging from mild weather to extreme cold weather.

2. CLASSIFICATION. The following types, classes and sizes are covered in this document.

Types:

Type I – Sleeping Bag, Patrol
Type II – Sleeping Bag, Intermediate Cold Weather (ICW)
Type III – Sleeping Bag, Extreme Cold Weather (ECW)
(Type I and Type II sleeping bags joined as one bag)
Type IV – Bivy Cover
Type V – Compression Bag, Large
Type VI – Compression Bag, Small

Classes:

Class 1 – Camouflage Green 483
Class 2 – Black 354
Class 3 – Woodland Camouflage Pattern
Class 4 – Foliage Green 504
Class 5 – Urban Gray 505
Class 6 – Universal Camouflage Pattern

Sizes:

Size 1 – Standard
Size 2 – Long

3. SALIENT CHARACTERISTICS.

3.1 General System Description.

The system shall consist of two "mummy bag" type sleeping bags (Type I and Type II sleeping bags), one waterproof bivy cover (Type IV) and two compression bags (Type V and Type VI compression bags). The bivy cover may be used by itself in warmer climates or as an outer cover for all combinations of the sleeping bags in colder climates to provide wind protection and wet weather protection against ground water, rain and snow.

a. The Type I sleeping bag is designed for use in temperate climates (temperatures ranging from 30 to 50 degrees Fahrenheit).

b. The Type II sleeping bag is designed for use in cold climates (temperatures ranging from minus 10 to 30 degrees Fahrenheit).

c. The Type III sleeping bag, for extreme cold climates, is formed using the Type I sleeping bag and Type II sleeping bag (as innermost layer) assembled in a layered and joined configuration and, when combined with the Type IV Bivy Cover (as outermost layer), is designed for use in cold climates to minus 20 degrees Fahrenheit when the user is wearing the lightweight undershirt and drawers or midweight shirt and drawers and standard cushion sole socks, to minus 30 degrees Fahrenheit when the user is also wearing fleece jacket and soft shell or loft trousers, and to minus 50 degrees Fahrenheit when the user is also wearing additional layers of the Extended Cold Weather Clothing System (ECWCS).

The sleeping bags shall be interoperable and capable of being joined with one another and the bivy cover using an attachment system (see 3.1.3) that does not inhibit the sleeping bag system capability for rapid egress of the user. The end item finished measurements shall conform to the requirements listed in Table II.

3.1.1 Standard sample. The materials used to fabricate the finished sleeping bags, bivy cover and stuff sacks shall match the applicable standard sample for shade and appearance, and shall, unless otherwise indicated, be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 3.1.8 and 7.3).

3.1.2 Seams and Stitching. All raw edges shall be surged or safety stitched prior to joining. There shall be no exposed raw edges. The stitch type shall be 301 or 401 for all joining seams. Each bag shall be double stitched along the slide fastener. Stitching shall be 9 to 12 stitches per inch. Threads exposed on the surface of the sleeping bag shall be ticket sized 30/2 or 3 ply (for all needles). Internal or hidden threads shall be ticket sized 50/2 ply (for all loopers or bottom). Bartacks shall be formed with 50/2 ply thread for both needle and loopers, 28 to 32 stitches per bartack and 1/2 to 5/8 inch in length. For sleeping bags, seam allowance shall be 3/4 inch on all quilted pieces and 3/8 to 1/2 inch on non-quilted pieces. For bivy cover, seam allowance shall be 1/4 inch for all sealed seams and 3/8 to 1/2 inch for all non-sealed seams.

3.1.3 Attachment (Fastener) System. The sleeping bags and bivy cover shall be made with a fastener system to join the individual sleeping bags and bivy cover. The fastener system shall be capable of joining the two bags with each other and the bivy cover to form one complete sleeping bag system. Fasteners must be appropriate for continuous use in hostile and austere environments, not inhibit the sleeping bag system capability for rapid egress of the user and be compatible with or provide a capability for interfacing with fastener systems of existing Army inventory sleeping bags and bivy cover. The sleeping bags and bivy cover shall be capable of being individually closed to the weather using a slide fastener closure.

3.1.4 Flammability. The materials used in conjunction with the Modular Sleeping Bag System will not be hazardous to personnel. Type I and Type II sleeping bags and bivy cover shall meet established federal/commercial flammability standards for sleeping bags (CPAI-75, see 7.2.5).

3.1.5 Toxicity. The finished sleeping bag system shall not present a health hazard and shall show compatibility with prolonged, direct skin contact when tested as specified in 3.1.5.1. Chemicals recognized by the Environmental Protection Agency (EPA) as human carcinogens shall not be used.

3.1.5.1 Toxicity test. When required (see 7.1), an acute dermal irritation study and a skin sensitization study shall be conducted on laboratory animals. When the results of these studies indicate the finished sleeping bag system is not a sensitizer or irritant, a Repeat Insult Patch Test shall be performed in accordance with the Modified Draize Procedure (see 7.2.7). If the toxicity requirement can be demonstrated with historical use data, toxicity testing may not be required (see 7.1).

3.1.6 Weight. The combined, maximum weight of the Type I and II sleeping bags shall not exceed 6.3 pounds for Size 1 and 6.6 pounds for Size 2. Total system weight of the system (Type I and II Sleeping Bags, Bivy Cover and Compression Bags) shall not exceed 9.8 pounds for Size 1 and 10.3 pounds for Size 2, when tested as specified in 3.1.6.1.

3.1.6.1 Weight test. The weight shall be determined using a calibrated scale or balance and measured to the nearest 0.1 pound.

3.1.7 Compression volume. When used with the large compression sack, the Type I and Type II sleeping bags and the bivy sack shall compress to a volume of no more than 1.0 cubic feet for Size 1 and no more than 1.3 cubic feet for Size 2, when tested as specified in 3.1.7.1.

3.1.7.1 Compression volume test. The Type I and Type II sleeping bags and bivy cover shall be stuffed into the large compression sack. The compression sack shall be closed and then compressed and cinched by hand to a uniform cylindrical shape of the smallest, practical volume. Using a measuring tool (i.e., steel yard stick), measure the maximum diameter and maximum height of the compressed sleep system to the nearest 0.25 inch. Calculate the compression volume of the sleep system to the nearest 0.1 cubic foot.

3.1.8 Color and standard sample. The color of the sleeping bags, bivy cover and compression bags shall be as specified (see 7.1). All materials and components shall match the applicable standard sample (see 7.3) when tested as specified in 3.1.8.1.

3.1.8.1 Color Matching. The color and appearance of the material or component shall match the standard sample when viewed using the AATCC Evaluation Procedure 9, Option A, with sources simulating artificial daylight and that have a correlated color temperature of $7500^{\circ} \pm 200^{\circ}$K, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at $2856^{\circ} \pm 200^{\circ}$K.

3.2 Detailed Component Description.

3.2.1 Type I, Sleeping Bag, Patrol. The Sleeping Bag, Patrol is designed to provide the user with adequate insulation to a low temperature of 30 degrees Fahrenheit.

3.2.1.1 Design.

The sleeping bag with integral hood shall be a mummy-shape design bag with right-hand location, slide fastener closure. The synthetic insulation of the bag shall be uniform throughout the sleeping bag; it shall be horizontally quilted to the liner in order to minimize insulation migration and cold spots. The foot box shall be anatomically designed and shall provide the same insulation properties as the body of the sleeping bag. The slide fastener closure shall have a device to prevent drafts and heat loss (a insulated draft flap, tube, or other such device; the insulation material shall be caught in the stitching along the entire length of the draft flap or tube); in addition, 2-1/2 inch wide webbing shall be attached to the entire length of this device to prevent the sleeping bag material from catching in the slide fastener. At the head of the bag, the slide fastener shall have a device to prevent inadvertent opening.

The sleeping bag shall have a hood with the same insulating properties as the body of the sleeping bag. It shall be constructed with three closure adjustments (crown adjustment and side adjustments for face opening (top and bottom)):

a. Crown adjustment. The adjustment at the crown of the hood shall consist of an elastic cord, nominal diameter of 3/16-inch, with knot and cord end and with a barrel lock that is attached to the sleeping bag in such a manner as to allow for one-handed operation.

b. Face adjustment. The adjusting mechanism at the side of the hood shall consist of a 3/8-inch flat nylon braid with knot and cord end and with a barrel lock attached to the sleeping bag in such a manner as to allow for one-handed operation and adjustment of the top of the face opening. A second mechanism at the side of the hood shall consist of a 1/8-inch nonelastic cord (see 3.3.1.4.2) with knot and cord end and using the same barrel lock as the nylon braid for adjustment of the bottom of the face opening. The nylon braid and nonelastic cord shall be of sufficient length and location as to not interfere with or be a hazard to the sleeping bag user.

The sleeping bag shall have a slide fastener closure along the right-hand side of the bag. The slide fastener shall be a reversible, double-pull, continuous-element slide fastener, 54 $\pm$ 1/4 inches in length, and be capable of opening to provide top or bottom ventilation when necessary. The slider pull shall have a nonelastic cord (see 3.3.1.4.2) thong routed and knotted through the slider and pull-tab to prevent noise and enhance zipper operation; the thong shall be 5-1/2 $\pm$ 1/4 inches in length and knotted at its end along with plastic cord end to enhance grip and zipper operation.

3.2.1.1.1 Label. The label shall be located in the center of the foot box panel at the bottom of the bag. The label shall be stitched on all four sides. The label shall be a combination identification label and care and use instruction label. The label shall match the color of the basic material; print type shall be black print with characters no smaller than 10 characters per inch. The print shall be waterproof and legible after five washings when tested in accordance with AATCC-96, Test VI, (A) for five cycles. At the bottom of the use instructions, the nomenclature, contract number, lot number, and contractor's name shall appear on the label. The label will contain the following inscription:

"INSTRUCTIONS FOR USE

1. Keep bag dry
    a. The outside of the bag is water repellent and will protect against light moisture.
    b. Select the driest ground possible.
    c. Breathe through the face opening to prevent moisture from wetting the bag.
    d. If face is cold, reduce hood opening by pulling on drawstrings. DO NOT TIE DRAWSTRINGS.
    e. DO NOT wear damp clothing and avoid sweating in bag. If too warm, remove some clothing or open the slide fastener for ventilation.
    f. When practical, open the bag completely and air dry through the day.
    g. Use sleeping pad or bivy cover to protect sleeping bag from ground moisture and dirt.
    h. When practical, wear clean, dry clothing in the bag.

2. Keep bag clean
    a. Wear sleeping bag hood drawn around head.
    b. Brush clothing, boots, and socks before entering bag.
    c. Remove grease and other contaminants from bag by spot cleaning with a damp cloth and soap.
    d. DO NOT SMOKE IN BAG. KEEP AWAY FROM OPEN FLAME.

3. Laundering (DO NOT DRY CLEAN, STARCH, or BLEACH)
    a. Turn the bag inside out and close all zippers before laundering.
    b. The sleeping bag shall be field laundered using formula II of FM 42-414, Appendix E.
    c. Launder in a standard commercial washing machine on delicate/gentle cycle and dry in a standard commercial dryer set on low temperature, tumble setting.
    d. Wash at less than 90 degrees Fahrenheit. Rinse in clear, cold water. Do not bleach.
    e. Dry at less than 130 degrees Fahrenheit using low tumble dry cycle, or air dry on a rust proof hanger. Do not press.

4. Configuration
    a. Sleeping Bag, Patrol is designed for use down to 30 degrees Fahrenheit.
    b. Sleeping Bag, Intermediate Cold is designed for use between 30 and minus 10 degrees Fahrenheit.
    c. Join bags by placing the Sleeping Bag, Intermediate Cold inside the Sleeping Bag, Patrol and affixing the two at all attachment points. Use only the Sleeping Bag, Patrol zipper to enter and exit. This configuration will protect from minus 10 to minus 50 degrees Fahrenheit when used with the layers of the Extended Cold Weather Clothing System.
    d. Use the bivy cover for protection from rain, snow, and wind.

5. Slide fastener operation
    a. To close the bag, keep both sides of the slide fastener close together before pulling the thong on the slider.
    b. For EMERGENCY EXIT, grasp each side of the opening above the slider and spread apart quickly forcing the slider downward.
    c. If chain separates below the slider, pull slider beyond separation, then pull slider up to reclose chain.
    d. If slide faster fails, use the attaching mechanisms intended to join bags together."

3.2.1.2 Color. The color of the sleeping bag and its components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.2.1.3 Weight. The sleeping bag shall weigh no more than 2.4 pounds for Size 1 and 2.5 pounds for Size 2, when tested in accordance with 3.1.6.1.

3.2.1.4 Thermal Insulation. No individual CLO value will be less than 3.0 when tested in accordance with Option 1 of ASTM F 1720.

3.2.1.5 Laundering Resistance. The sleeping bag insulation shall not clump after machine washing when tested in accordance with AATCC-96, Test VI, (A) for five cycles and with drying temperature between 140 and 160 degrees Fahrenheit.

3.2.1.6 Compression Recovery. The sleeping bag insulation shall regain 80% or better of its loft when tested after laundering in accordance with 3.2.1.5. For determining compression recovery, the initial thickness shall be measured with the sample under light pressure of 0.0004 lb/in^2. The sample shall then be placed under a pressure of 0.067 lb/in^2 and held for one hour. The thickness after compression shall be immediately measured in the same manner as initial thickness. The percent of recovery will be calculated as follows:

$$\text{Percent Compression Recovery} = \frac{\text{Thickness After Compression}}{\text{Initial Thickness}} \times 100$$

3.2.2 Type II, Sleeping Bag, ICW. The Sleeping Bag, ICW is designed to provide the user with adequate insulation to a low temperature of minus 10 degrees Fahrenheit

3.2.2.1 Design.

The sleeping bag with integral hood shall be a mummy-shape design bag with right-hand location, slide fastener closure. The synthetic insulation of the bag shall be lightweight, compressible, and uniform throughout the sleeping bag. It shall be horizontally quilted such that one layer of insulation is quilted to the shell material and one layer is quilted to the lining material; in the finished end item, the quilting stitch seams of the shell material shall be offset approximately midway from the stitch lines of the lining material. The sleeping bag shall have an insulated, adjustable, full width chest collar to prevent air drafting between the hood and the sleeping bag body. The collar shall consist of front and back torso collar sections which are

independently adjustable using elastic cords. Each cord with knot and cord end shall have a barrel lock attached to the sleeping bag in such a manner as to allow for one-handed operation. The cord shall be of sufficient length and location as to not interfere with or be a hazard to the sleeping bag user. It shall use the same insulating material as the rest of the sleeping bag which shall also be caught in the stitching along the entire length of the chest collar to prevent twisting or distortion. The foot box shall be anatomically designed and shall provide the twice the insulation properties as the body of the sleeping bag. The slide fastener closure shall have a device to prevent drafts and heat loss (a draft flap, tube, or other such device); in addition, 2-1/2 inch wide webbing shall be attached to the entire length of this device to prevent the sleeping bag material from catching in the slide fastener. At the head of the bag, the slide fastener shall have a device to prevent inadvertent opening.

The sleeping bag shall have a hood with the same insulating properties as the body of the sleeping bag. It shall be constructed with three closure adjustments (crown adjustment, neck and hood side adjustments) in order to increase heat retention. The adjustment at the crown of the hood shall consist of an elastic cord, of nominal diameter of 3/16 inch, with a barrel lock that is attached to the sleeping bag in such a manner as to allow for one-handed operation. The adjusting mechanism at the side of the hood shall consist of a 3/8 inch flat nylon braid with a barrel lock attached to the sleeping bag in such a manner as to allow for one-handed operation. The cord shall be of sufficient length and location as to not interfere with or be a hazard to the sleeping bag user.

The sleeping bag shall have a slide fastener closure along the right-hand side of the bag. The slide fastener shall be a reversible, double-pull, continuous-element slide fastener, 54 $\pm$ 1/4 inches in length, and be capable of opening to provide top or bottom ventilation when necessary. The slider pull shall have a flat nylon tape routed and knotted through the slider and pull-tab to prevent noise and enhance zipper operation; the tape shall be 5-1/2 $\pm$ 1/4 inches in length and knotted at its end to enhance grip and zipper operation.

3.2.2.1.1 Label. The label shall be in accordance with 3.2.1.1.1.

3.2.2.2 Color. The color of the sleeping bag and its components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.2.2.3 Weight. The sleeping bag shall weigh no more than 3.9 pounds for Size 1 and 4.1 pounds for Size 2, when tested in accordance with 3.1.6.1.

3.2.2.4 Thermal Insulation. No individual CLO value shall be less than 4.5 when tested in accordance with Option 1 of ASTM F 1720.

3.2.2.5. Laundering Resistance. The sleeping bag insulation shall not clump after machine washing when tested in accordance with 3.2.1.5.

3.2.2.6 Compression Recovery. The sleeping bag insulation shall regain 80% or better of its loft when tested as specified in 3.2.1.6.

3.2.3 Type III, Sleeping Bag, ECW. The Sleeping Bag, ECW shall consist of the Type I, Sleeping Bag, Patrol, the Type II, Sleeping Bag, ICW, and the Type III, Bivy Cover to provide the user with adequate insulation at temperatures ranging from minus 10 to minus 50 degrees Fahrenheit when supplemented with selected insulation components of the Extended Cold Weather Clothing System.

3.2.4 Type IV, Bivy Cover. The Bivy Cover is used with either sleeping bag or with the two bags mated to create the Sleeping Bag, Extreme Cold Weather (ECW). It is lightweight and extremely compressible and will fit with the two bags in the Compression Bag. It will provide the user with protection from wind, snow, rain, and other forms of precipitation by providing a waterproof outer layer of the sleeping bag system.

3.2.4.1 Design The bivy cover with integral hood shall be a mummy-shape design bag with right-hand location closure. All stitching of bivy cover seams shall be 9-12 stitches per inch and shall be sealed using the appropriate method with seam seal tape. Seams shall be sealed; seam sealant (i.e., seam tape), if used, will be applied only on the inside of the bivy cover.

3.2.4.1.1 Label. The label shall be located in the top inside flap near the head end. The label shall be stitched on all four sides, but not through external layers of material. The label shall be a combination label and contain identification and care and use instructions. The label shall match Camouflage Green 483 for Class 3 bivy covers and Foliage Green 504 for Class 6 bivy covers; print type shall be black print with characters no smaller than 10 characters per inch. The print shall be waterproof and legible after five washing cycles when tested in accordance with AATCC-96, Test VI, (A). The label will contain the following inscription:

"BIVY COVER FOR SLEEPING BAG

Use with the Sleeping Bag, Patrol, the Sleeping Bag, Intermediate Cold Weather, the Sleeping Bag, Extreme Cold Weather (both bags) or by itself.

LAUNDERING BIVY COVER

Wash in standard commercial washing machine and dry in standard commercial dryer set on its low tumble setting.

Wash and rinse at less than 100 degrees Fahrenheit using low cycle. Dry at less than 100 degrees Fahrenheit using low tumble dry cycle."

3.2.4.2 Color. The color of the bivy cover and its components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.2.4.3 Weight. The weight of the finished bivy cover shall be less than 2.0 pounds for the Size 1 and 2.1 pounds for Size 2, when tested as specified in 3.1.6.1.

3.2.4.4 Compactability. The bivy cover shall have a compacted volume of not more than 121 cubic inches for the Size 1 and 127 cubic inches for Size 2, when tested as specified in ASTM F 1853 except that the measuring cylinder shall be 5.5 inches in diameter and the load applied shall be 100 pounds.

3.2.4.5 Resistance to Laundering. Sealed seams shall show no evidence of tape end lifting, tape curling, bubbling, separation along tape edges or across the tape width, or (if 3 layer tape) tape top knit shrinkage more than 1/8 inch exposing the tape membrane or middle layer, before and after leakage testing, and shall show 'No leakage' when tested as specified in 3.2.4.5.1.

3.2.4.5.1 Laundering Test. The complete bivy cover shall be laundered in accordance with AATCC-96, Test VI, (A) for five (5) laundering cycles. The drying temperature shall be less than 100 degrees Fahrenheit. After laundering, the bivy cover shall be visually inspected for conformance to sealed seam tape integrity and tested for seam leakage as follows:

Inspection. The sealed seam shall be visually examined for evidence or any sign of tape end lifting, tape curling, bubbling, separation along tape edges or across the tape width, or (if 3 layer tape) tape top knit shrinkage more than 1/8 inch exposing the tape membrane or middle layer. The occurrence of any of the defects constitutes test failure.

Seam Leakage Test. The sealed seam shall be flexed for ten (10) cycles in the following manner: The seam shall be grasped using the thumb and fingers of each hand in such a manner that the thumbs are parallel to each other and approximately ½ inch beyond (outside) the edges of the tape; with the seam held firmly in the above manner, the thumbs shall be brought together so the cloth and the tape are in contact; the sealed area shall be flexed vigorously ten cycles with the cloth and tape in contact throughout the flexing. The flexing action will be such that, when fully flexed in either direction, there will be a minimum of two inches between each thumbnail when the flexed area is fully extended with the test area in contact with itself at all times. The test area shall then be re-examined for evidence of defects of 5.2.1.2 prior to conducting the seam leakage test. The seam leakage test shall be conducted in accordance with ASTM D 751, hydrostatic resistance, Procedure B, Procedure 1. The hydrostatic head shall be 50 cm, applied to the outside (face side) of the bivy cover sealed seam, and maintained for 3 minutes. The finished bivy cover shall be tested at three of the following locations: a straight seam along the length, a crossovers seam in the lower half (foot section area) and on a curved seam in the head section (hood area). Leakage is defined as the appearance of one or more droplets of water in the 4-1/2 inch test area. Evidence of leakage in one or more seam locations will constitute test failure.

3.2.5. Type V, Compression Bag, Large. The Large Compression Bag shall be a 10-1/2 inch diameter, circular flat-bottom, cylinder-shaped bag of 10-1/2 inch diameter bottom and appropriate length dimension capable of containing and compressing the Type III sleeping bag system and Type IV bivy cover to meet the compression volume requirement (see 3.1.7). It shall be fully operable allowing the user wearing cold weather mittens to stuff the sleeping bag system into the bag and to loosen all fasteners for easily removal of the sleeping bag system.

3.2.5.1 Design: The Compression Bag shall be constructed with water resistant materials. All exposed cut edges of the material shall be serged or overstitched to prevent yarn raveling. The bag shall have a top cover flap that allows for full coverage of the bag opening. The bag shall have a reinforced screen-type ventilator to allow for air to escape during the compression process. The bag shall have four, compression straps uniformly-spaced about the bag circumference and parallel to the length dimension of the bag, joining a top cover flap to the body of the compression bag. The straps shall be comprised of one-inch wide webbing with durable buckles and fasteners to cinch down the bag; two straps adjacent to each other shall have one-inch, double bar, adjustment buckles and the remaining two adjacent straps shall have one-

inch, side release fasteners that allow for quick bag access. The compression bag shall also have two, circumferential compression straps each with one-inch, double bar, adjustment buckles. A nonelastic drawcord with barrel lock shall be located in a tunnel at the top of the bag to cinch the top of the bag closed; the tunnel opening shall be reinforced. The compression bag shall have an internal flap with identification label located at the top, drawcord closure.

3.2.5.1.1 Color. The color of the compression bag and its components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.2.5.1.2 Label. The label shall be located on the center top flap of the bag. The label shall be stitched on all four sides. The label shall contain identification and care instructions. The label shall match the color of the basic material; print type shall be black print with characters no smaller than 10 characters per inch. The print shall be waterproof and legible after 5 washings when tested in accordance with AATCC-96, Test VI, (A) for five cycles. The label will contain the following inscription:

"INSTRUCTIONS FOR USE

1. TO PACKAGE THE MODULAR SLEEPING BAG:
   (a) Tightly fold and roll the modular sleeping bag and place into the compression stuff sack.
   (b) Place flap over the modular sleeping bag and pull the drawcord tight to close the stuff sack.
   (c) Position the top cover flap to cover the bag opening and adjust the compression straps to maximize compression.

2. TO KEEP THE COMPRESSION STUFF SACK CLEAN:
   (a) Brush and clean the modular sleeping bags before placing into the compression stuff sack.
   (b) Remove dirt and grease from the compression stuff sack by spot cleaning with a damp cloth and soap.

3. MAINTENANCE:
   (a) Repair the compression stuff sack in accordance with D/A TM 10-8400-201-23."

3.2.6 Type VI, Compression Bag, Small. The Small Compression Bag shall be a flat-bottom, cylinder-shaped bag of 10-1/2 inch diameter bottom and appropriate length dimension capable of containing any two of the three sleep system main components (Type I sleeping bag; Type II sleeping bag; Type IV bivy cover). It shall be fully operable allowing the user wearing cold weather mittens to stuff the two-component sleeping bag system into the bag and to loosen all fasteners for easily removal of the sleeping bag system.

3.2.6.1 Design: The Compression Bag shall be constructed with water resistant materials. All exposed cut edges of the material shall be serged or overstitched to prevent yarn raveling. The bag shall have a top cover flap that allows for full coverage of the bag opening. The bag shall have a reinforced screen-type ventilator to allow for air to escape during the compression process. The bag shall have three, compression straps uniformly-spaced about the bag

circumference and parallel to the length dimension of the bag, joining a top cover flap to the body of the compression bag. The straps shall be comprised of one-inch wide webbing with durable double bar buckles to cinch down the bag; two straps shall have one-inch, double bar, adjustment buckles and the remaining strap shall have a one-inch, side release fastener that allow for quick bag access. A nonelastic drawcord with barrel lock shall be located in a tunnel at the top of the bag to cinch the top of the bag closed; the tunnel opening shall be reinforced. The compression bag shall have an internal flap with identification label located at the top, drawcord closure.

3.2.6.1.1 Color. The color of the compression bag and its components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.2.6.1.2 Label. The label shall be in accordance with 3.6.5.1.2.

3.3 Materials and Components - General

3.3.1 Sleeping Bag - Materials and Components

3.3.1.1 Basic Material. The basic material for the inner and outer shell of the Sleeping Bag, Patrol and Sleeping Bag, ICW shall be nylon, ripstop woven fabric having water repellent properties. The finished fabric shall have a minimum weight of 1.9 ounces per square yard when tested in accordance with ASTM D 3775 (Option C) and a minimum yarn count of 98 ends per inch and 98 picks per inch when tested in accordance with ASTM D 3776. The color of the sleeping bags and their components shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.3.1.1.1 Tear Strength. The basic material shall have minimum tear strength of 9.0 pounds in the warp and filling directions when tested as specified in ASTM D 1424.

3.3.1.1.2 Spray Rating. After five laundering cycles, the basic material shall have a minimum spray rating of 90,90,80 when tested in accordance with AATCC-135, procedure (1) (V) (A) (i) and AATCC-22.

3.3.1.2 Batting Material. The insulation batting material shall be selected by the contractor to meet the thermal insulation requirements of the finished end item.

3.3.1.3 Slide Fasteners. The slide fastener shall be a continuous element fastener conforming to Type II, Style 5 (except that the bottom stop shall be closed), Size 9 or 10 of A-A-55634 except that it shall have a minimum chain filament diameter of 0.033 inch, a minimum closed chain width of 0.032 inch, a minimum crosswise breaking strength of 250 pounds in accordance with test method ASTM D 2061 and a total width (including tape) of 1 inch. Slide fastener tape shall be polyester and water repellent treated. The slider body shall not be equipped with a pull or thong. A 12 inch piece of nonelastic cord (see 3.3.1.4.2) shall be looped through the slider lug (normally used for the pull) and the free ends knotted to form the slider thong; for the Type I sleeping bag only, a cord end (see 3.3.1.11) shall also be attached. The color of the chains, sliders and tapes shall match the basic color of the sleeping bags and bivy cover when tested in accordance with 3.1.8.1.

3.3.1.4 Cords.

3.3.1.4.1 Elastic cord. The elastic drawcord shall be 3/16 inch nominal diameter. The color of the drawcord shall match the basic material of the sleeping bag when tested in accordance with 3.1.8.1.

3.3.1.4.2 Nonelastic cord. The non-elastic drawcord shall be 1/8 inch nominal diameter in accordance with PIA-C-5040 (See 7.2.9). The color of the drawcord shall match the color of the basic material when tested in accordance with 3.1.8.1.

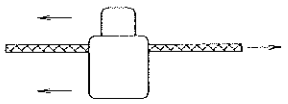
3.3.1.5 Braid. The braid shall be 3/8 inch wide, flat nylon or polyester braid. The color shall match the basic material of the sleeping bag when tested in accordance with 3.1.8.1.

3.3.1.6 Webbing. Webbing shall be 2-1/2 inch synthetic fiber, woven webbing. The color shall match the basic material of the sleeping bag when tested in accordance with 3.1.8.1.

3.3.1.7 Thread. The thread for all seams shall be water repellent and meet A-A-50199. The color shall match the basic material of the sleeping bag when tested in accordance with 3.1.8.1.

3.3.1.8 Barrel Lock. The barrel lock shall withstand a 5 pound pull force for 15 seconds with no signs of slippage or damage after being on the non-elastic cord (see 3.3.1.4.2) for 168 hours when tested as specified in 3.3.1.8.1. For Class 3 bivy cover, the color of the barrel lock shall be Black 357; for Class 6 bivy cover, the color of the barrel lock shall be Foliage Green 504 when tested in accordance with 3.1.8.1.

3.3.1.8.1 Barrel lock test. The barrel lock holding strength shall be tested as follows:



Barrel lock holding strength: Using tensile testing machine (in accordance with ASTM D 5034) at 2 inches/minute, either pull-up cord on stationary engaged cord-lock or vice-versa (see above illustration.).

3.3.1.9 Fastener, joining. The fasteners, if used, to join the sleeping bags and bivy cover shall be NASM 27980 or as described in 3.1.3.

3.3.1.10 Tape, hook and loop. The hook and loop fastener tape shall conform to Type II, Class 1 of A-A-55126, with selvage edges. No slit or split edges are permitted. Sew all hook and loop minimum of 1/8 inch from bound selvage to prevent needle cutting along edges. To prevent raveling, do not sew directly on selvage. However, each required width shall maintain a tolerance of $\pm$1/32-inch as to prevent stitching runoffs or improper fit into automatic sewing equipment. The color shall match the basic material of the sleeping bag when tested in accordance with 3.1.8.1.

3.3.1.11 Cord end cap, plastic. The plastic cord end cap (see 7.4) shall finish two ends of cord (see 3.3.1.4). The color of the cord end cap shall be Foliage Green 504 when tested in accordance with 3.1.8.1.

3.3.2 Bivy Cover - Material and Components

3.3.2.1 Basic Material. The basic material shall conform to requirements of MIL-DTL-31011, Type I, paragraphs 3.3 through 3.13 except that the weight shall be 4.0 ounces/square yard (maximum) and the breaking strength shall be 120 pounds (minimum) in both the warp and filling directions. The color of the bivy cover shall match the following when tested as specified in 3.1.8.1:

a. When Class 3 bivy cover is specified (see 7.1), the material used for the top of the finished bivy cover shall match Woodland Camouflage Pattern (Class 1 of MIL-DTL-31011) and that for the bottom/ground sheet of the bivy cover shall match Light Green 354 of the Woodland Camouflage Pattern.

b. When Class 6 bivy cover is specified (see 7.1), the material used for the top of the finished bivy cover shall match Universal Camouflage Pattern (Class 4 of MIL-DTL-31011) and that for the bottom/ground sheet of the bivy cover shall match Foliage Green 504, as specified in 3.3.2.1.1.

3.3.2.1.1 Color, Pattern and Spectral Reflectance of Class 4, Foliage Green 504. The color of the face side of the cloth shall match the applicable standard sample. The cloth shall match Foliage Green 504 color when tested in accordance with 3.1.8.1. The spectral reflectance of the color of the cloth shall conform to the requirements specified in the following Table I when tested as specified in MIL-DTL-31011.

TABLE I. Spectral Reflectance, percent - Foliage Green 504

Wavelengths Nanometers (nm)	Foliage Green 504	
	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

3.3.2.2 Seam sealant. If seam sealant (i.e., tape) is used, the color shall be translucent or a subdued color approximating the back side of the bivy cover material.

3.3.2.3 Slide Fastener. The slide fastener for the bivy cover shall be as specified in 3.3.1.3. The color of the slide fastener shall match the color of the bottom/ground sheet basic material when tested in accordance with 3.1.8.1.

3.3.2.4 Hook and Loop Fastener. The hook and loop fastener for the bivy cover shall be as specified in 3.3.1.10. The color of the slide fastener shall match the color of the bottom/ground sheet basic material when tested in accordance with 3.1.8.1.

3.3.2.5 Barrel Lock. The barrel lock shall be as specified in 3.3.1.8. The color of the barrel lock shall match the color of the bottom/ground sheet basic material when tested in accordance with 3.1.8.1.

3.3.2.6 Fastener, joining. The fasteners, if used, to join the sleeping bags and bivy cover shall be NASM 27980 or as described in 3.1.3.

3.3.3 Compression Bag - Material and Components

3.3.3.1 Basic material. The basic material shall be synthetic fiber, woven fabric having water-repellent properties and weigh between 3.8 and 4.8 ounces per square yard when tested in accordance with ASTM D 3775 (Option C).

3.3.3.1.1 Breaking Strength. The material shall have a minimum breaking strength of 275 pounds for the warp direction and 225 pounds for the filling direction when tested in accordance with test method ASTM D 5034.

3.3.3.1.2 Spray Rating. Minimum spray rating shall be 90, 90, 80 when tested in accordance with test method AATCC-22.

3.3.3.1.3 Color. The color of the compression bag shall be as specified (see 7.1) when tested in accordance with 3.1.8.1.

3.3.3.2 Cord, non-elastic. The nonelastic drawcord shall be as specified in 3.3.1.4.2. The color of the drawcord shall match the color of the basic material when tested in accordance with 3.1.8.1.

3.3.3.3 Webbing. All compression strap webbing shall be one-inch wide and shall conform to Type III of MIL-W-43668. The color of the webbing shall match the color of the basic material when tested in accordance with 3.1.8.1.

3.3.3.4 Fastener Buckles. The fastener buckles used shall be the types as follows and the color of the buckles shall match the color of the basic material when tested in accordance with 3.1.8.1.

3.3.3.4.1 Ladderloc, 1-Inch conforming to Drawing 2-6-101.

3.3.3.4.2 Side-Release Fastener, 1-Inch conforming to Drawing 2-4-1010.

3.3.3.5 Barrel Lock. The barrel lock shall be as specified in 3.3.1.8. The color of the barrel lock shall match the color of the basic material when tested in accordance with 3.1.8.1.

3.3.3.6 Ventilator. The screen-type ventilator with washers shall be brass and have a black chemical finish. The ventilators shall have a 9/16 ± 1/16 inch opening with a No. 50-70 mesh and a 40 to 60% opening (see 7.4.2).

3.3.3.7 Grommet. The grommet shall conform to NASM 16491.

4. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. PRODUCT CONFORMANCE.

5.1 Product Conformance. The products provided shall meet the salient characteristics of this Purchase Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5.2 Visual Examination. The finished end item (sleeping bag or bivy cover) shall be examined for the defects listed in 5.2.1 and any other characteristics determined to affect the form, fit or function of the item as determined by the government representative shall be classified as a defect. The lot size shall be expressed in units of the finished end item. The sample unit shall be one finished end item.

5.2.1 Defects.

5.2.1.1 Sleeping bags. Any hole, cut or tear; color not as specified; any part shaded; any spot or stain (outside); raw edges, open seams, thread ends not removed, or loose tension resulting in loose seams; any material defects, distorted parts or poor workmanship; any component part omitted; any drawcord omitted, caught in stitching, end not sealed, missing end cap or barrel lock or knot (when required), insufficient length, color not as specified; any component material not caught in stitching (where required); any fasteners omitted, not as specified, broken, burrs or sharp edges, insecurely affixed or improperly positioned or oriented; any slide fastener not as specified, missing components or thong, broken, not functioning properly, or color not as specified.

5.2.1.2 Bivy cover. Any material defects of smash, multiple float, loose slub, cut, tear, mend, burn, needle chew or hole; any spot, stain or streak; any thread ends not trimmed or visible basting threads; any defective or omitted component; any drawcord omitted, caught in stitching, end not sealed, missing end cap or barrel lock or knot (when required), insufficient length, or color not as specified; any fasteners omitted or not as specified, broken, burrs or sharp edges, insecurely affixed or improperly positioned or oriented; any slide fastener not as specified, missing components or thong, broken, not functioning properly, or color not as specified; any

seams badly twisted, pleated or puckered, any part of the finished end item caught in unrelated stitching operation thread color not as specified, any open seam, any loose or tight thread tension, any broken or missing stitches; any lifting or separation of seam sealant/tape on waterproof seams or visible scorching of the basic material.

5.2.1.3 Labels and packaging. Any label missing, illegible, incorrect, or color not as specified; bar code omitted or not readable by scanner; human readable interpretation (HRI) omitted or illegible; bar code not visible on folded, package item; bar code causes damage to the item; any items not packaged in accordance with the contract or purchase order.

5.3 Finished Measurements. All measurements shall be taken using a steel measuring rule. See Figure 1 for reference points used in determining length and width dimensions. The finished measurement of sleeping bags and bivy cover and compression bags shall be as specified in Table II.

TABLE II. Finished measurements.

Component	Size	Length, inches	Width $_{W}$, inches 1/	Width $_{N}$, inches 2/	Diameter, inches 4/	Slide Fastener Length, inches 5/
Sleeping Bags-						
Patrol:	Std	81 to 83	35 to 37	22 to 34	N/A	54
	Long	87 to 89	35 to 37	22 to 24	N/A	54
Intermediate (ICW):	Std	81 to 83	34 to 36	21 to 23	N/A	54
	Long	87 to 89	34 to 36	21 to 23	N/A	54
Bivy Cover-	Std	81 to 83	34 to 36	27 to 29	N/A	54
	Long	87 to 89	34 to 36	27 to 29	N/A	54
Compression Bags-	Large	23.5 3/	N/A	N/A	10.4 to 10.6	N/A
	Small	19.5 3/	N/A	N/A	10.4 to 10.6	N/A

1/ Widest width.
2/ Narrowest width.
3/ For guidance purposes only. Measure from bottom stitch line to top, folded edge of drawcord tunnel.
4/ Measure from bottom stitch line across the diameter to bottom stitch line.
5/ Measure from bottom of bottom stop to top of top stop. Allowable measurement tolerance is +/- 1/4 inch.

5.3.1 Finished Measurement Inspection Procedure.

Preparation –

Sleeping Bags – Turn the sleeping bag inside out, lay flat and close the slide fastener.
Bivy Cover – Lay the bivy cover face side down, flat and close the slide fasterner and cover flap.

Procedure – (see Figure-1)

Length: Measure length from footbox seam (where the footbox attaches to the body of the item) to the crown of the hood.

Widest Width (Width $_W$): Measure the widest width from folded edge to folded edge at 'Length $_W$', approximately 60 inches from foot box seam for Size 1 and approximately 65 inches for Size 2.
Narrowest Width (Width $_N$): Measure the narrowest width from folded edge to folded edge at 'Length $_N$' of approximately 5 inches for both sizes.

5.4 Acceptance Criteria. The acceptance criteria shall be specified in the contract or purchase order.

6. PACKAGING.

6.1 Packaging. Preservation, packing, and marking shall be specified in the contract or order.

7. NOTES.

7.1 Ordering Data. Acquisition documents must specify the following:

a. Title, number, and date of this document.
b. Type, Class, Size required.
c. When Toxicity requirements is required. (see 3.1.5)
d. Product conformance provisions (see 5.4)
e. Sampling procedures (see 5.2 and 5.3)
f. Packaging requirements (see 6.1)

7.2 Sources of documents.

DRAWINGS:

U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND

2-4-1010 - Side Release Fastener, 1-Inch
2-6-101 - Ladderloc, 1-Inch
2-1-1516B - Woodland Camouflage Pattern
2-1-2519 - Universal Camouflage Pattern

(Copies of drawings are available from the U.S. Army Natick Soldier RD&E Center, ATTN: AMSRD-NSC-IP-E, Kansas St., Natick, MA 01760-5019)

7.2.2 AATCC Standards are available online at www.aatcc.org or from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.

7.2.3 ANSI/ASQ Standards are available online at http://www.asq.org or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.)

7.2.4 ASTM Standards are available online at www.astm.org or from ASTM INTERNATIONAL, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

7.2.5 CPAI Standards are available from Industrial Fabrics Association International, 1801 County Road B W., Roseville, MN 55113.

7.2.6 Federal Acquisition Regulations are available online at http://acquisition.gov/far/index.html or by contacting the Superintendent of Documents at 202-512-1800.

7.2.7 Principles and Methods of Toxicology (fourth edition), A Wallace Hayes (editor), pp 1057 - 1060, 2001 are available from Taylor and Francis, Philadelphia PA or http://www.taylorandfrancis.co.uk/.

7.2.8 NASM documents may be purchased from the Aerospace Industries Association of America, 1250 Eye Street, N.W., Suite 1200, Washington, DC 20005-3924. http://www.aia-aerospace.org.

7.2.9 PIA Standards may be purchased from the Parachute Industry Association Headquarters, Specification Committee, 3833 W. Oakton St., Skokie, IL., 60076 or at http://www.pia.com

7.3 Standard samples. For standard samples, address the contracting activity issuing the invitation for bids or request for proposal.

7.4 Suggested Sources:

7.4.1 Cord end cap, plastic. Cord end cap, style LC03WE of YKK Fastening Products Group or equal.

7.4.2 Ventilators. No. D53, screen-type ventilators with washers (see 3.3.3.6) by Stimpson Company, 900 Sylvan Avenue, Bayport, NY 11705, or equal.

7.5 Key words.

Bivy
Compression

MILITARY INTERESTS:

Custodians
Army – GL

Civil Agency Coordinating Activity

Preparing Activity
Army – GL

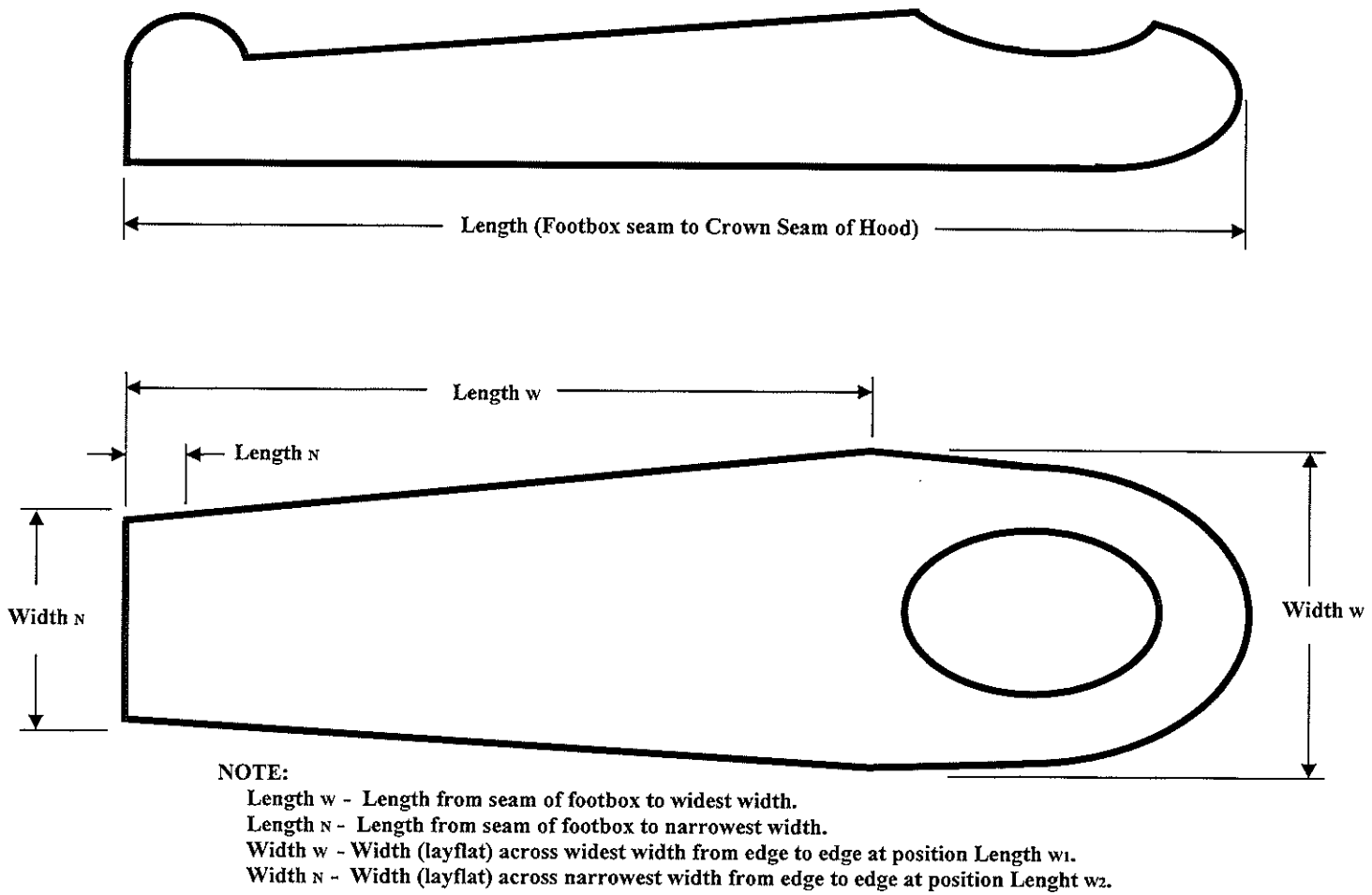


Figure 1. Reference Points for Dimensional Measurements of Sleeping Bags and Bivy Cover.