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MILITARY SPECIFICATION

SEA MARKER PACKET, INFLATABLE SURVIVAL EQUIPMENT

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

1. SCOPE

1.1 This specification covers the requirements for one type and size of an inflatable survival equipment sea marker packet.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

V-T-295	Thread, Nylon
RR-S-366	Sieve, Test
DDD-T-86	Tape, Textile, Cotton, General Purpose (Unbleached, Bleached, or Dyed)
PPP-B-636	Boxes, Shipping, Fiberboard

Military

MIL-T-5038	Tape, Textile and Webbing, Textile, Reinforcing Nylon
MIL-T-5661	Tape and Webbing, Textile, Woven Reinforcing, Cotton

FSC 6850

SPECIFICATIONS

Military (Continued)

MIL-I-6903	Ink, Marking (for Parachutes and Other Textile Items)
MIL-G-16491	Grommet, Metallic

STANDARDS

Federal

FED-STD-191	Textile Test Methods
FED-STD-595	Colors
FED-STD-751	Stitches, Seams, and Stitchings

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage

(When requesting any of the applicable documents, refer to both title and number. Copies of the applicable documents required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 First article - Unless otherwise specified, the inflatable survival equipment sea marker packet furnished under this specification shall be a product which has been inspected and has passed the first article inspection specified in 4.3 through 4.3.2.

3.2 Materials and components - The materials and components shall conform to the applicable specifications and standards as listed or required herein.

3.2.1 Sea marker dye - The sea marker medium shall be a sodium salt type fluorescein dye. When inspected as specified in 4.6.1 through 4.6.1.5, the sea marker dye shall conform to Table I.

TABLE I

SEA MARKER DYE PROPERTIES

CHARACTERISTICS	REQUIREMENTS
Color	Yellow-Green
Volatile loss, percent, maximum	12.0
Sodium fluorescein content, percent, minimum	75.0
Insoluble material, percent, maximum	1.0
Particle size - Amount retained on a Number 40 sieve	None

3.2.2 Cloth -

3.2.2.1 Envelope and attaching patch coated cloth construction - The envelope and the attaching patch shall be fabricated from the coated cloth, 3.2.2.1.3, which shall consist of the base cloth, 3.2.2.1.1, and the coating compound, 3.2.2.1.2.

3.2.2.1.1 Base cloth - The base cloth shall be of a synthetic composition, weight, strength, and construction which shall produce, after processing, a coated cloth conforming to the requirements of 3.2.2.1.3.

3.2.2.1.2 Coating compound - The coating compound used in coating the base cloth shall be a suitably compounded vinyl resin which shall contain phosphate and phthalate plasticizers (see 6.2(g)) to insure adequate resistance of the vinyl resin to mildew and bacteria degradation. The coating compound shall be compatible with the base cloth and shall be free from acid, chemicals, or any other ingredient that will adversely affect the sea marker dye and dye container or impair the strength, coating adhesion, or sealability of the coated cloth. The compound shall not crack or become sticky or tacky, when exposed to various temperatures.

3.2.2.1.3 Coated cloth - The coated cloth shall consist of the base cloth and the coating compound suitably processed so that the resultant coated cloth shall conform to the requirements of Table II, when inspected as specified in 4.6.2 through 4.6.2.4.

TABLE II

COATED CLOTH PROPERTIES

CHARACTERISTICS	REQUIREMENTS
Color	Lusterless Yellow, approximately match Color Number 33538 of FED-STD-595
Breaking strength, pounds, minimum:	
Warp	190
Filling	170
Tearing strength, pounds, minimum:	
Warp	9.0
Filling	7.0
Coating adhesion, pounds per inch of width, minimum	6.0
Resistance to cold	Shall not crack or flake nor shall the coating separate from the cloth
Blocking, maximum	2

3.2.2.2 Dye container - The dye container cloth, when inspected as specified in 4.6.3 and 4.6.3.1, shall conform to Table III.

TABLE III

DYE CONTAINER CLOTH PROPERTIES

CHARACTERISTICS	REQUIREMENTS
Material	Cotton
Color	Natural
Weave	Plain
Yarns per inch, minimum:	
Warp	66
Filling	70
Breaking strength, pounds, minimum:	
Warp	48
Filling	38
Ounces per square yard, minimum	2.7
Nonfibrous materials, percent, maximum	9.0

3.2.3 Tape -

3.2.3.1 Attaching - The attaching tape, for securing the sea marker packet to the life preserver, clothing, or other equipment, shall be nylon conforming to MIL-T-5038, Type III, one inch wide. The color shall approximately match Lusterless Yellow, Color Number 33538 of FED-STD-595, when inspected as specified in 4.6.2.1.

3.2.3.2 Suspending - The suspending tape, for securing the dye container to the innerside of the packet, shall be unbleached cotton tape conforming to DDD-T-86, Type I, Class 1, one inch wide. As an alternate, the suspending tape may be the same as the attaching tape, 3.2.3.1, or fabricated from the coated cloth, 3.2.2.1.3.

3.2.3.3 Vent - The vent tapes shall be cotton, conforming to MIL-T-5661, Type II or III, 1/2 inch wide, natural color, suitably treated to be water resistant. When inspected as specified in 4.6.4, the increase in weight shall be not greater than 20 percent.

3.2.4 Grommets - The grommets shall conform to MIL-G-16491, Type I, Class 3, Size Number 00.

3.2.5 Thread - All the sewing shall be accomplished with the nylon thread conforming to V-T-295, Type I or II, Class 1 or 2, Size E, color optional.

3.3 Design - The inflatable survival equipment sea marker packet shall consist of the sea marker dye enclosed within the dye container (cotton cloth bag) and the envelope. One end of the suspending tape shall be securely sewn to the sea marker dye container. The other end shall be sewn to the attaching patch and then heat sealed to the innerside of the envelope as specified in Figures 2 and 4. If the suspending tape shall be fabricated of the coated cloth as specified in 3.2.3.2, the tape shall be heat sealed to packet as specified in Figures 5 and 7. The cloth bag, containing the dye, shall be enclosed within the heat sealed envelope. The envelope shall contain two water resistant vent tapes to allow the packet to breathe and expand, during changes in altitude, without bursting or damage to the packet. The packet shall contain a pull tab so that the packet can be readily opened and the cotton cloth bag containing the sea marker dye exposed to the sea water. The packet shall conform in outward appearance to Figure 1.

3.4 Construction - The size, shape, and construction of the sea marker packet shall conform to Figures 1 through 7, as applicable. The cut ends of the nylon suspending tape shall be seared or treated to prevent fraying. No sharp edge shall be formed nor shall the searing or the method of treating the cut edges have any deleterious effect on the tape. No portion of the suspending tape or dye container shall be caught in any portion of any heat seal.

3.4.1 Stitching - The stitching on the dye container shall be accomplished with the nylon thread using Stitch Type 301 conforming to FED-STD-751 with a minimum of 8 stitches per inch.

3.4.2 Dye container - The dye container shall be fabricated from the cotton cloth in accordance with Figure 4. When filled with the dye, the dye container shall not contain any split, tear, rip, cut, or hole. The dye container, when inspected as specified in 4.6.7 through 4.6.7.2, shall conform to Table IV.

TABLE IV

DYE CONTAINER PROPERTIES

CHARACTERISTICS	REQUIREMENTS
Weight of the dye, ounces	3.4 to 3.7
Solubility, percent, minimum	85.0

3.5 Performance inspection -

3.5.1 Weight - The assembled packet shall weigh not more than 5.0 ounces, when inspected as specified in 4.6.6.1.

3.5.2 Expansion due to altitude and waterproofness - When inspected as specified in 4.6.6.2, the packet shall not burst, break, or tear. The sealed area shall remain intact and the packet shall be waterproof and not leak nor shall the water be stained by the dye in the packet.

3.5.3 Opening pull - The force required to open the packet shall be not less than 8 pounds nor more than 22 pounds, when inspected as specified in 4.6.6.3.

3.6 Markings - Unless otherwise specified, the markings shall be legible and durable letters and numerals, which shall be thoroughly dry prior to packaging. The markings shall be as specified in Figure 1 and shall be accomplished with the marking ink conforming to MIL-I-6903, black in color. As an alternate, the markings may be accomplished by a dry heat transfer process or by a combination using the marking ink and a dry heat transfer process. The heat used to transfer the markings shall not stiffen, scorch, or damage the coated cloth. The markings shall be centered.

3.7 Workmanship - The sea marker packets shall not contain any non-specified hole, tear, cut, mend, burn, needle chew, spot, stain, or abraded area. Each grommet shall be securely clinched without distortion, damage, splitting, or cutting of the coated cloth or tape. No metal component shall contain any sharp edge, sliver, nick, crack, or burr. All thread scraps, lint, and foreign matter

shall be removed. Because of the emergency and life support use of this equipment, the importance of providing a product of uniform excellent quality cannot be overemphasized. The sea marker packets shall be uniform in quality and shall be free from any irregularity or defect which could adversely affect performance, reliability, or durability. The sea marker packets shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the acceptance criteria established herein.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of inspection - The examination and testing of the inflatable survival equipment sea marker packets shall be classified as follows:

(a) First article inspection - First article inspection consists of examinations and tests performed on samples which are representative of the production item after award of a contract to determine that the production item conforms to the requirements of this specification (see 3.1 and 4.3 through 4.3.2).

(b) Quality conformance inspection - Quality conformance inspection consists of examinations and tests performed on individual products or lots to determine conformance of the products or lots to the requirements set forth in this specification (see 4.4 through 4.4.1.2).

4.3 First article inspection - The first article inspection of the inflatable survival equipment sea marker packets shall consist of examination and tests for all of the requirements of this specification.

4.3.1 First article samples - Unless otherwise specified, as soon as practicable after the award of the contract or order, the manufacturer shall submit the following samples:

One piece of the coated cloth 36 by 72 inches minimum
One piece of the dye container cotton cloth 36 by 72 minimum
One 24 inch minimum length of the vent tape
Six assembled packets

The samples shall be representative of the construction, workmanship, components, and materials to be used during production. When a contractor is in continuous production of these packets from contract to contract, submission of further first article inspection samples on the new contract may be waived at the discretion of the procuring activity (see 6.2(c)). Approval of the first article inspection samples or the waiving of the first article inspection does not preclude the requirements for performing the quality conformance inspection. The first article inspection samples shall be furnished to the Government as directed by the contracting officer. (see 6.2(d)).

4.3.2 Upon completion of the first article inspection, all the applicable inspection reports and when applicable, recommendations and comments pertinent for use in monitoring production will be forwarded to the cognizant Government activity. One of the approved first article inspection sample packets will be returned to the manufacturer for use in monitoring production. The remaining five packets will be consumed or destroyed in the first article inspection and shall not be considered as part of the quantity to be delivered under the contract.

4.4 Quality conformance inspection - The sampling and inspection levels shall conform to MIL-STD-105. The quality conformance inspection shall consist of the following:

Inspection of the sea marker dye
Inspection of the coated cloth
Inspection of the dye container cloth
Water resistance of the vent tapes
Visual examination of the packets
Dimensional check of the packets
Weight of the packets
Expansion due to altitude and waterproofness of the packets
Opening pull
Weight of the dye in the dye containers
Solubility of the dye in the dye containers
Preparation for delivery

4.4.1 Sampling -

4.4.1.1 Inspection lot -

4.4.1.1.1 Sea marker dye - An inspection lot size shall be expressed in units of one pound of the sea marker dye and shall consist of all the sea marker dye received by the sea marker packet manufacturer at one time. The sample unit shall be one pound of the sea marker dye.

4.4.1.1.2 Coated cloth - An inspection lot size shall be expressed in units of one linear yard of the coated cloth and shall consist of all the coated cloth received by the sea marker packet manufacturer at one time. The sample unit shall be one linear yard of the coated cloth.

4.4.1.1.3 Dye container cloth - An inspection lot size shall be expressed in units of one linear yard of the dye container cloth and shall consist of all the dye container cloth received by the sea marker packet manufacturer at one time. The sample unit shall be one linear yard of the dye container cloth.

4.4.1.1.4 Vent tape - An inspection lot size shall be expressed in units of one linear yard of the vent tape and shall consist of all the vent tape received by the sea marker packet manufacturer at one time. The sample unit shall be one linear yard of the vent tape.

4.4.1.1.5 Sea marker packets - An inspection lot size shall be expressed in units of one assembled sea marker packet made essentially under the same conditions and from the same materials and components. The sample unit shall be one assembled sea marker packet.

4.4.1.1.6 Preparation for delivery - An inspection lot size shall be expressed in units of one fully prepared shipping container, containing assembled sea marker packets, fully prepared for delivery from essentially the same materials and components. The sample unit shall be one shipping container, containing assembled sea marker packets, fully prepared for delivery with the exception that it need not be sealed.

4.4.1.2 Sampling for tests and examinations of the sea marker dye, coated cloth, dye container cloth, vent tape, assembled sea marker packets, and preparation for delivery - The sample size, acceptance criteria, tests, and examinations required for the sea marker dye, coated cloth, dye container cloth, vent tape, assembled sea marker packets, or the preparation for delivery, as applicable, shall be as specified in Table V.

TABLE V

SAMPLE SIZE, ACCEPTANCE CRITERIA, TESTS, AND EXAMINATIONS OF THE SEA MARKER DYE, COATED CLOTH, DYE CONTAINER CLOTH, VENT TAPE, ASSEMBLED SEA MARKER PACKETS, AND PREPARATION FOR DELIVERY

ITEM	INSPECTION	PARAGRAPH		SAMPLE SIZE	ACCEPTANCE CRITERIA 1/
		REQUIREMENT	METHOD		
Sea marker dye 2/	Color	3.2.1	4.6.1.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Volatile loss	3.2.1	4.6.1.2	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Sodium fluorescein content	3.2.1	4.6.1.3	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Insoluble material	3.2.1	4.6.1.4	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Particle size	3.2.1	4.6.1.5	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
Coated cloth 2/	Color	3.2.2.1.3	4.6.2.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Breaking strength	3.2.2.1.3	4.6.2.2	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Tearing strength	3.2.2.1.3	4.6.2.2	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Coating adhesion	3.2.2.1.3	4.6.2.2	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Resistance to cold	3.2.2.1.3	4.6.2.3	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Blocking	3.2.2.1.3	4.6.2.4	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
Dye container cloth 2/	Material	3.2.2.2	4.6.3.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Color	3.2.2.2	Visual	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Weave	3.2.2.2	Visual	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Yarns per inch	3.2.2.2	4.6.3.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Breaking strength	3.2.2.2	4.6.3.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Weight	3.2.2.2	4.6.3.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Nonfibrous materials	3.2.2.2	4.6.3.1	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units

TABLE V (Continued)

ITEM	INSPECTION	PARAGRAPH		SAMPLE SIZE	ACCEPTANCE CRITERIA 1/
		REQUIREMENT	METHOD		
Vent tape 2/	Water resistance	3.2.3.3	4.6.4	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
Assembled packet	Visual examination (outerside of the packet)	3.3, 3.4, 3.6, 3.7, and Figure 1	4.6.5.1.1	Every assembled packet for major defects. Inspection Level II for minor defects	Reject all units with any major defect and an acceptable quality level of 4.0 defects per 100 units for minor defects
	Dimensional check (outerside of the packet)	Figures 1, 3, and 6, as applicable	4.6.5.1.1	Inspection Level S-3	An acceptable quality level of 4.0 defects per 100 units
	Weight	3.5.1	4.6.6.1	Inspection Level S-2	An acceptable quality level of 1.5 defects per 100 units
	Expansion due to altitude and waterproofness 3/	3.5.2	4.6.6.2	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Opening pull 4/	3.5.3	4.6.6.3	Inspection Level S-1	An acceptable quality level of 1.5 defects per 100 units
	Visual examination (innerside of the packet)	3.3 through 3.4.2, 3.7, and Figures 2 through 7, as applicable	4.6.5.1.2	3/	An acceptable quality level of 1.5 defects per 100 units for major defects and 4.0 defects per 100 units for minor defects
	Dimensional check (innerside of the packet)	Figures 2 through 7, as applicable	4.6.5.1.2	3/	An acceptable quality level of 4.0 defects per 100 units
	Weight of the dye	3.4.2	4.6.7.1	3/	An acceptable quality level of 1.5 defects per 100 units
	Solubility of the dye	3.4.2	4.6.7.2	4/	An acceptable quality level of 1.5 defects per 100 units
	Preparation for delivery	Section 5	4.6.5.2	Inspection Level S-2	An acceptable quality level of 2.5 defects per 100 units

1/ The sampling plan acceptance numbers shall apply collectively to all the characteristics within a stated acceptable quality level.

2/ The inspection of the sea marker dye and the coated cloth shall be conducted either at the contractor's or subcontractor's plant.

3/ The visual examination (innerside of the packet), dimensional check (innerside of the packet), and the weight of the dye in the dye container shall be determined on the assembled packets used in the expansion due to altitude and waterproofness inspection.

4/ The solubility of the dye in the dye container shall be determined on the assembled packets used in the opening pull inspection.

4.5 Inspection conditions -

4.5.1 Synthetic sea water - When sea water is specified in an inspection, synthetic sea water of the composition specified in Table VI shall be used. The synthetic sea water shall be prepared by dissolving the sodium sulfate in distilled water and then adding the dissolved sodium sulfate to the solution containing the other dissolved salts. If necessary, an adjustment of the pH to 8.0 shall be made by the addition of 1N sodium hydroxide. The final volume shall be brought up to one litre.

TABLE VI

COMPOSITION OF THE SYNTHETIC SEA WATER

INGREDIENTS	GRAMS PER LITER
Anhydrous Sodium Chloride (NaCl)	22.347
Magnesium Chloride ($MgCl_2.6H_2O$)	9.759
Anhydrous Sodium Sulfate (Na_2SO_4)	3.337
Anhydrous Calcium Chloride ($CaCl_2$)	0.944
Anhydrous Sodium Bicarbonate ($NaHCO_3$)	0.168

4.5.2 Grade of reagents - When reagents are required in an inspection, commercially available American Chemical Society (ACS) grade reagents shall be used. When ACS grade reagents are not available, the highest commercially available purity grade shall then be used.

4.5.3 Constant weight - When constant weight is specified, the heating and drying shall be conducted at a temperature of 212 to 221 degrees Fahrenheit (100 to 105 degrees centigrade) and limited to a maximum period of 24 hours. A glass rod shall be used to mechanically aid the drying process.

4.6 Inspection methods -

4.6.1 Sea marker dye -

4.6.1.1 Color - One gram of the dye shall be dissolved in a 400 millilitre beaker containing 200 millilitres of the sea water, 4.5.1. The solution shall be maintained at a temperature of 68 ±4 degrees Fahrenheit (20 ±2 degrees Centigrade) and shall be stirred for a maximum of one minute. The color of the solution shall then be observed for conformance to 3.2.1 in the following manner:

(a) Place the beaker on a flat surface, out of doors, and observe the color of the solution by looking down into the beaker.

4.6.1.2 Volatile loss - An approximately 10 gram specimen of the dye shall be placed in a tared glass weighing bottle fitted with a ground glass cover and

shall be weighed to the nearest milligram. The bottle, with the cover removed and containing the dye sample, shall be dried to a constant weight (see 4.5.3). At the end of a 24 hour drying period, the bottle shall be stoppered and then transferred to a desiccator. After cooling to room temperature, the container and sample shall be reweighed to obtain the final weight. The volatile loss of the dye shall be determined as follows:

$$\text{Percent Volatile Loss} = \frac{\text{Initial Weight} - \text{Final Weight}}{\text{Initial Weight}} \times 100$$

4.6.1.3 Sodium fluorescein content - One ±0.05 gram of the dye, dried to constant weight (see 4.5.3), shall be dissolved in a 400 millilitre beaker containing 200 millilitres of distilled water. The solution shall be heated to boiling. While gently boiling, a 10 percent hydrochloric acid solution shall be added slowly, dropwise, with constant stirring, until the solution is acid to the congo red paper. It is essential that the hydrochloric acid solution be added while the dye solution is boiling to prevent the formation of the soluble yellow form of fluorescein. The 10 percent hydrochloric acid solution shall be made by adding 10 millilitres of concentrated hydrochloric acid to 90 millilitres of distilled water. Mix thoroughly before adding to the dye solution. The dye solution, when acid to the congo red paper, shall be removed from the source of heat and cooled to 68 ±4 degrees Fahrenheit (20 ±2 degrees Centigrade). The solution and residue shall then be filtered through a tared medium pore size Gooch crucible. The residue shall be transferred quantitatively by means of a policeman using distilled water as wash water. When the residue has been completely transferred, it shall be washed with 75 millilitres of distilled water. The crucible containing the residue shall then be dried to constant weight (see 4.5.3). At the end of the drying period, the Gooch crucible containing the residue shall be quickly transferred to a desiccator. After cooling to room temperature, the crucible containing the residue shall be weighed. The sodium fluorescein content shall be determined as follows:

$$\text{Percent sodium fluorescein} = \text{weight of residue} \times 113$$

4.6.1.4 Insoluble material - Thirty ±1 grams of the dye, dried to constant weight (see 4.5.3), shall be dissolved in a 250 millilitre beaker containing 100 millilitres of hot distilled water. The solution shall be gently boiled for 15 minutes. The water level shall be maintained constant throughout the boiling. Immediately after 15 minutes, and while hot, the solution and residue shall be filtered through a tared medium pore size Gooch crucible. The residue shall be transferred quantitatively by means of a policeman using hot distilled water as wash water. When the residue has been completely transferred, it shall be washed with hot distilled water until free of color. The crucible and residue shall then be dried to constant weight (see 4.5.3). At the end of the drying period, the Gooch crucible containing the residue shall be quickly transferred to a desiccator. After cooling to room temperature, the crucible containing the residue shall be weighed. The amount of the insoluble material shall be determined as follows:

$$\text{Percent insoluble material} = \frac{\text{weight of residue}}{\text{initial dye weight}} \times 100$$

4.6.1.5 Particle size - An approximately 20 gram specimen of the dye shall be weighed to the nearest decigram. The weighed dye specimen shall be placed on a Size Number 40 sieve conforming to RR-S-366. A dry tared pan of sufficient size shall be attached or placed under the sieve to receive the dye particles passing through the sieve. The dye particles on the sieve shall be gently brushed with a camels hair brush for a period of 2 minutes. If any dye particles remain on the sieve, after the 2 minute brushing, weigh the dye particles that passed through the sieve and calculate the amount retained on the sieve as follows:

$$\text{Percent retained} = \frac{\text{initial dye weight - weight of dye passing through sieve}}{\text{initial dye weight}} \times 100$$

4.6.2 Coated cloth -

4.6.2.1 Color matching - The color of the component shall be compared to the applicable approved standard shade under natural (north sky) daylight or artificial daylight having a color temperature of 7500 degrees Kelvin.

4.6.2.2 Breaking strength, tearing strength, and coating adhesion - The breaking strength, tearing strength, and coating adhesion of the coated cloth shall be determined by the following methods of Federal Standard 191:

INSPECTION	METHOD
Breaking strength	5100
Tearing strength	5134
Coating adhesion	5970

4.6.2.3 Resistance to cold - Two specimens, 1 by 4 inches, shall be cut with the long dimension of one in the warp direction, and the other in the filling direction. The two specimens shall be exposed to a temperature of minus 65 ±4 degrees Fahrenheit (-54 ±2.2 degrees Centigrade) for 4 hours and then quickly [illegible], face out, over a 1/8 inch rod so that the backs of the specimens touch each other. The samples and rod shall be handled with gloves and care taken that the specimen temperature remains uniform throughout the inspection. The rod and gloves shall also be conditioned at the inspection temperature, prior to the bending of the specimens.

4.6.2.4 Blocking - The blocking characteristic shall be determined in accordance with FED-STD-191, Method 5872. The temperature shall be 150 ±4 degrees Fahrenheit (65.6 ±2.2 degrees Centigrade) and the time of exposure shall be 6 ±1/4 hours.

4.6.3 Dye container cloth -

4.6.3.1 Material, yarns per inch, breaking strength, weight, and non-fibrous materials - The material, yarns per inch, breaking strength, weight, and

nonfibrous materials of the dye container cloth shall be determined by the following methods of Federal Standard 191:

INSPECTION	METHOD
Material	1200
Yarns per inch	5050
Breaking strength	5100
Weight	5041
Nonfibrous materials	2611

4.6.4 Water resistance of the vent tape - A 12 inch length of the vent tape shall be inspected for water resistance in accordance with FED-STD-191, Method 5500.

4.6.5 Visual examination -

4.6.5.1 Assembled packets -

4.6.5.1.1 Outerside - The outerside of every assembled packet shall be examined visually for major defects to determine conformance to this specification. The outerside of each assembled packet, selected as a sample unit from the lot, shall be thoroughly checked dimensionally and examined visually for minor defects to determine conformance to this specification. The classification and list of defects, Tables VII and VIII, as applicable, shall be used to classify and enumerate the defects found.

TABLE VII

CLASSIFICATION OF DEFECTS FOR THE VISUAL EXAMINATION OF THE OUTERSIDE OF THE ASSEMBLED PACKETS

DEFECT	MAJOR	MINOR
GENERAL		
a. Any non-specified hole, scissors or knife cut, tear, mend, burn, smash, multiple float, loose slub, or abraded area	X	
b. Color of any component not as specified	1/	
c. Any spot or stain		X
d. Any portion of the packet stiffened, scorched, or damaged by any process of manufacture	X	

TABLE VII (Continued)

DEFECT	MAJOR	MINOR
GROMMETS		
a. Any loose, misaligned, distorted, surface rough, or contains any nick, burr, sharp edge, crack, or metal sliver	X	
b. Any surface unclean, contains embedded foreign matter, finish missing, or improperly finished		X
c. Any improperly clinched resulting in cutting of the cloth or tape	X	
COMPONENTS AND ASSEMBLY		
a. Any cut end of the attaching tape not seared or treated; any sharp edge formed due to the searing or treatment	X	
b. Any vent tape protruding more than 3/16 inch beyond the outer edge of the envelope		X
c. Any portion of any heat sealed area open or the tab heat sealed to the envelope	X	
d. Any component not as specified or any defect of a component or defect of assembly, not herein classified	1/	
e. Any component, component part, or required operation omitted or any operation improperly performed, not herein classified	1/	
MARKINGS		
a. Any missing, incorrect, incomplete, illegible, improperly located, or not centered		X

1/ The defect shall be classified as major, when it seriously affects the serviceability, otherwise it shall be classified as a minor defect.

TABLE VIII

LIST OF DEFECTS FOR THE OUTERSIDE DIMENSIONS OF THE ASSEMBLED PACKETS

EXAMINE	DEFECT
OUTERSIDE OF THE PACKET	
Measure the length and width of the assembled packet, length of the pull tab, location of the grommets, length of the attaching tape and the amount protruding on each side of the packet, and the size of the markings.	Any measurement deviating from the dimensions and tolerances as specified in Figures 1, 3, and 6, as applicable, shall be enumerated as a dimensional defect.

4.6.5.1.2 Innerside - Prior to the visual examination and the dimensional check of the innerside of the packet, each assembled packet, selected as a sample unit from the lot, shall be opened fully. The innerside of the packet shall be thoroughly checked dimensionally and examined visually for major and minor defects to determine conformance to this specification. The classification and list of defects, Tables IX and X, as applicable, shall be used to classify and enumerate the defects found.

TABLE IX

CLASSIFICATION OF DEFECTS FOR THE VISUAL EXAMINATION OF THE INNERSIDE OF THE ASSEMBLED PACKETS

	DEFECT	MAJOR	MINOR
a.	Color of any component not as specified		X
b.	Any spot or stain	1/	
c.	When applicable, any cut end of the suspending tape not seared or treated or any sharp edge formed due to the searing or treatment	X	
d.	Any hole, split, tear, rip, scissor or knife cut, smash, multiple float, loose slub, needle chew, or abraded area	X	
e.	Any portion of the suspending tape cloth patch or the end of the coated cloth suspending tape, as applicable, not securely heat sealed to the back panel	X	
f.	Not specified stitch type		X
g.	One or two stitches per inch less than specified		X

TABLE IX (Continued)

DEFECT	MAJOR	MINOR
h. Three or more stitches per inch less than specified	X	
i. Any component not as specified or any defect of a component or defect of assembly, not herein classified	1/	
j. Any component, component part, or required operation omitted or any operation improperly performed, not herein classified	1/	
k. Any evidence that the dye container or suspending tape was caught in any portion of any heat sealed seam	X	
l. Any portion of the packet stiffened, scorched, or damaged by any process of manufacture	X	

1/ The defect shall be classified as major, when it seriously affects the serviceability, otherwise it shall be classified as a minor defect.

TABLE X

LIST OF DEFECTS FOR THE INNERSIDE DIMENSIONS OF THE ASSEMBLED PACKETS

EXAMINE	DEFECT
INNERSIDE OF THE PACKET	
Measure the width of the heat seal, distance from the bottom of the assembled packet to the top portion of the heat seal, location of the vent tapes, and all the dimensions applicable to the suspending tape and the location of the attachment.	Any measurement deviating from the dimensions and tolerances as specified in Figures 2 through 7, as applicable, shall be enumerated as a dimensional defect.

4.6.5.2 Preparation for delivery - Each of the fully prepared shipping containers, containing assembled packets, selected as a sample unit from the lot, shall be visually examined to determine that the packaging, packing, and marking conform to this specification. The list of defects, Table XI, shall be used to enumerate the defects found.

4.6.6 Assembled packets -

4.6.6.1 Weight - The weight of the assembled packet shall be determined on any scale or balance capable of weighing to the nearest 0.01 ounce.

TABLE XI

LIST OF DEFECTS FOR PREPARATION FOR DELIVERY

ITEM	DEFECT
Exterior and interior markings	Missing, incorrect, incomplete, or illegible; of improper size, location, sequence, or method of application; markings not the same on the interior and exterior containers.
Packaging and packing materials	Any non-conforming component; any component or component part missing, damaged, or otherwise defective.
Workmanship	Inadequate application of the components such as incomplete closure of any container flap or any loose strapping; bulging or distortion of any container.
Exterior and interior weight or content	Gross or net weight exceeds the requirement; number per container more or less than specified; any packet deformed, distorted, or bent.

4.6.6.2 Expansion due to altitude and waterproofness - The expansion due to altitude portion of this inspection may be conducted simultaneously on more than one packet. The packet or packets, as applicable, shall be wiped to remove all traces of the dye from the surfaces of the packet. The assembled packet or packets, as applicable, shall be placed in a suitable airtight container. The pressure within the container shall be reduced, in a maximum time of 15 seconds, to an absolute pressure of 100 ±10 millimetres of mercury, maintained for 20 seconds, returned to ambient pressure in a maximum time of 15 seconds, and maintained for 10 seconds. The decrease in pressure and return and maintenance at ambient pressure shall be repeated for four additional times (a total of 5 times). Upon the fifth return to ambient conditions, the packet shall be examined for any hole, tear, break, and for any opening in any seam. The lot shall be rejected if any packet bursts or contains any hole, tear, break, or any portion of any heat sealed seam is open. If the packet or packets, as applicable, are intact, the vent area shall be sealed off from water entry. The waterproofness portion of this inspection shall be conducted individually on each packet. Each packet shall then be submerged individually in clean fresh water, at a temperature of 75 ±5 degrees Fahrenheit (24 ±3 degrees Centigrade), for one minute to assure that there is no dye on the surfaces of the packet. The packet shall then be pulsated underwater, by alternately pressing down on the packet and then removing the hand (one cycle), for a total of 3 cycles. The lot shall be rejected if the packet bursts or if the water is stained, by the action of the water on the dye inside the packet, due to the pulsating action on the packet.

4.6.6.3 Opening pull - The force required to open the packet shall be determined by placing the back upper portion of the packet in the upper jaw and the tab in the lower jaw of a suitable inspection apparatus equipped with an autographic recording device (see FED-STD-191, Method 5100). The packet shall be opened until a maximum of 2 inches of the side seals remains unopened. The highest value obtained shall be taken as the result of the inspection. The rate of jaw separation under no load shall be 12 ±1/2 inches per minute and the front jaw of each clamp shall be 1 by 3 inches.

4.6.7 *Dye container properties* -

4.6.7.1 Weight of dye - The dye, while in the cloth bag, shall be weighed on any scale or balance capable of weighing to the nearest 0.01 ounce. The dye shall then be removed from the cloth bag. The empty cloth bag shall be weighed and then subtracted from the weight of the dye plus the cloth bag to obtain the weight of the dye.

4.6.7.2 Solubility - The suspending tape shall be cut off as close to the bag as possible without disturbing the stitching that seals the bag. The dye, in its cloth bag, shall be dried to constant weight (see 4.5.3) and the weight recorded as the initial weight. The dye, in its cloth bag, shall then be placed in a tank containing 20 litres of the synthetic sea water, 4.5.1, maintained at a temperature of 68 ±4 degrees Fahrenheit (20 ±2 degrees Centigrade) (see Figure 8). The synthetic sea water shall be agitated by a motor-driven centrifugal pump having a capacity of 2 litres per minute. At the end of 45 minutes from the time of immersion, the dye, in its cloth bag, shall be immediately removed from the sea water, dried, and weighed. The weight shall be recorded as the final weight. The cloth bag shall then be thoroughly washed and rinsed in fresh water to remove all of the dye. The cloth bag shall then be dried and weighed and the weight recorded to the nearest decigram. The solubility of the dye shall be calculated by the use of the initial and final weights of the dye only (minus the recorded weight of the cloth bag converted to ounces by dividing the weight in grams by 28.35). The quantity dissolved shall be calculated as a percentage of the original weight and shall conform to the requirement specified in Table IV.

5. PREPARATION FOR DELIVERY

5.1 Packaging - Packaging shall be Level A or C, as specified (see 6.2(e)).

5.1.1 Level A - Each inflatable survival equipment sea marker packet, prior to being packaged, shall have the tie tapes folded back and wrapped around the top of the packet. The packets shall be paired by inverting one of each pair so that the bottom of one corresponds to the top of the other. Six pairs, 12 packets, shall be packaged within a snug fitting fiberboard container conforming to PPP-B-636, Type CF or SF, Weather-Resistant Class, Variety SW, Grade optional. The sea

marker packets shall be neatly arranged within the fiberboard box without creating any wrinkles or creases. Each container shall be constructed and closed in accordance with the appendix to PPP-B-636.

5.1.2 Level C - The sea marker packets shall be packaged to afford the minimum degree of protection necessary to prevent deterioration or damage during shipment under normal environmental conditions and commercial modes of transportation.

5.2 Packing - Packing shall be Level A, B, or C, as specified (see 6.2(e)).

5.2.1 Level A - Twelve containers, one hundred and forty-four sea marker packets packaged as specified in 5.1.1, shall be packed as specified in 5.2.2, except that the fiberboard container shall be Weather-Resistant Class, Variety SW, Grade V3c or V3s. In addition, each container shall be reinforced with flat steel strapping or tape banding in accordance with the appendix to PPP-B-636.

5.2.2 Level B - Twelve containers, one hundred and forty-four sea marker packets packaged as specified in 5.1.1, shall be packed within a snug fitting fiberboard container conforming to PPP-B-636, Type CF or SF, Domestic Class, Variety SW, Grade 275. Each container shall be constructed and closed in accordance with the appendix to PPP-B-636.

5.2.3 Level C - The packaged sea marker packets which require packing for acceptance by the carrier shall be packed within exterior type shipping containers in a manner that shall insure safe transportation at the lowest rate to the point of delivery. The shipment shall conform to the minimum requirements of the rules and regulations applicable to the mode of transportation selected.

5.3 Marking - In addition to any special markings required by the contract or order (see 6.2(f)), the interior and exterior containers shall be marked in accordance with MIL-STD-129 and shall include the date of assembly (month and year). As an alternate, the interior and exterior containers shall be marked with the final month and delivery date, provided all the units are manufactured within 90 days after the assembly of the first unit.

6. NOTES

6.1 Intended use - The sea marker packet covered by this specification is intended to be used with water type survival equipment. It is intended for use in attracting the attention of rescuers to personnel forced down or adrift at sea, by forming a bright yellow green area, when the packet is open and the dye container with the dye in it is in the water.

6.2 Ordering data - Procurement documents shall specify the following:

(a) Title, number, and date of this specification.

(b) Quantity desired.

(c) Whether the first article inspection is waived (see 4.3.1).

(d) Name and address of the first article inspection laboratory (see 4.3.1).

(e) Selection of applicable levels of packaging and packing (see 5.1 through 5.1.2 and 5.2 through 5.2.3).

(f) Whether any additional markings are required (see 5.3).

(g) Certificate of compliance for the plasticizer (see 3.2.2.1.2).

6.3 Data - For the information of contractors and contracting officers, any of the data, specified in applicable documents, listed in Section 2 of this specification, or referenced lower-tier documents, need not be prepared for the Government and shall not be furnished to the Government, unless specified in the contract or order. The data, to be furnished, shall be listed on DD Form 1423 (Contractor Data Requirements List), which shall be attached to and made a part of the contract or order. NavWeps Form 4200/25 (Drawings, Lists, and Specifications Required) shall be attached where applicable.

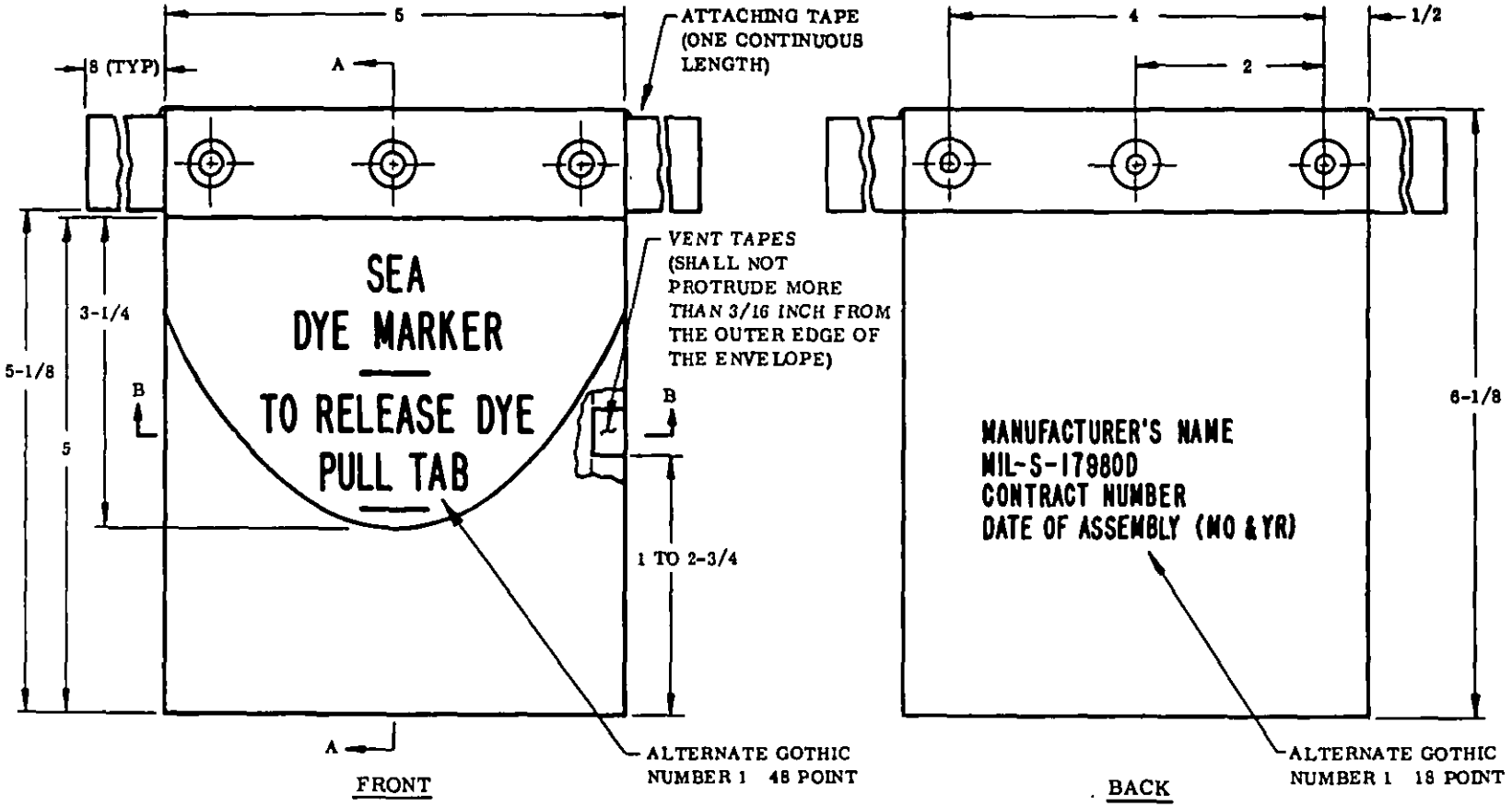
Custodians:
Army - MU
Navy - AS
Air Force - 68

Review activities:
Army - AV and MD
Air Force - 11

User activities:
Navy - MC and SH

Preparing activity:
Navy - AS
(Project No. 6850-0508)

NOTICE - Review/user information is current as of date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current federal Supply Classification Listing of DOD Standardization Documents.



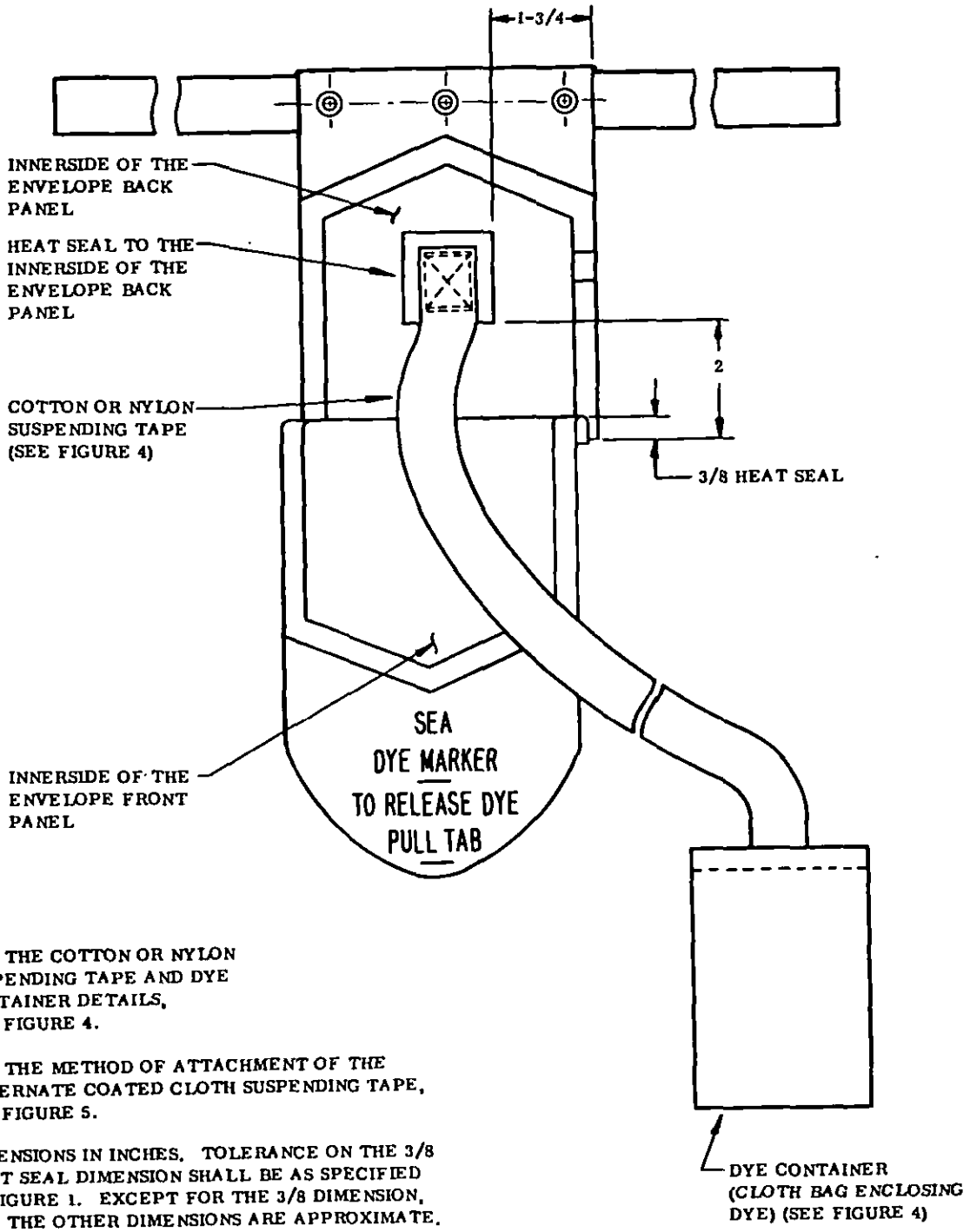
DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS SHALL BE AS FOLLOWS:

DIMENSIONS	TOLERANCES
0 TO 1/2 INCLUSIVE	±1/32
OVER 1/2 TO 1 INCLUSIVE	±1/16
OVER 1 TO 5 INCLUSIVE	±1/8
OVER 5 TO 10 INCLUSIVE	±1/4
OVER 10	±3/8

FOR SECTIONS A-A AND B-B, APPLICABLE FOR THE COTTON OR NYLON SUSPENDING TAPE, SEE FIGURE 3.

FOR SECTIONS A-A AND B-B, APPLICABLE FOR THE ALTERNATE COATED CLOTH SUSPENDING TAPE, SEE FIGURE 6.

FIGURE 1. FRONT AND BACK OF THE PACKET



FOR THE COTTON OR NYLON SUSPENDING TAPE AND DYE CONTAINER DETAILS, SEE FIGURE 4.

FOR THE METHOD OF ATTACHMENT OF THE ALTERNATE COATED CLOTH SUSPENDING TAPE, SEE FIGURE 5.

DIMENSIONS IN INCHES. TOLERANCE ON THE 3/8 HEAT SEAL DIMENSION SHALL BE AS SPECIFIED IN FIGURE 1. EXCEPT FOR THE 3/8 DIMENSION, ALL THE OTHER DIMENSIONS ARE APPROXIMATE.

FIGURE 2. PACKET SHOWN OPEN FOR SHOWING METHOD OF ATTACHMENT OF THE COTTON OR NYLON SUSPENDING TAPE

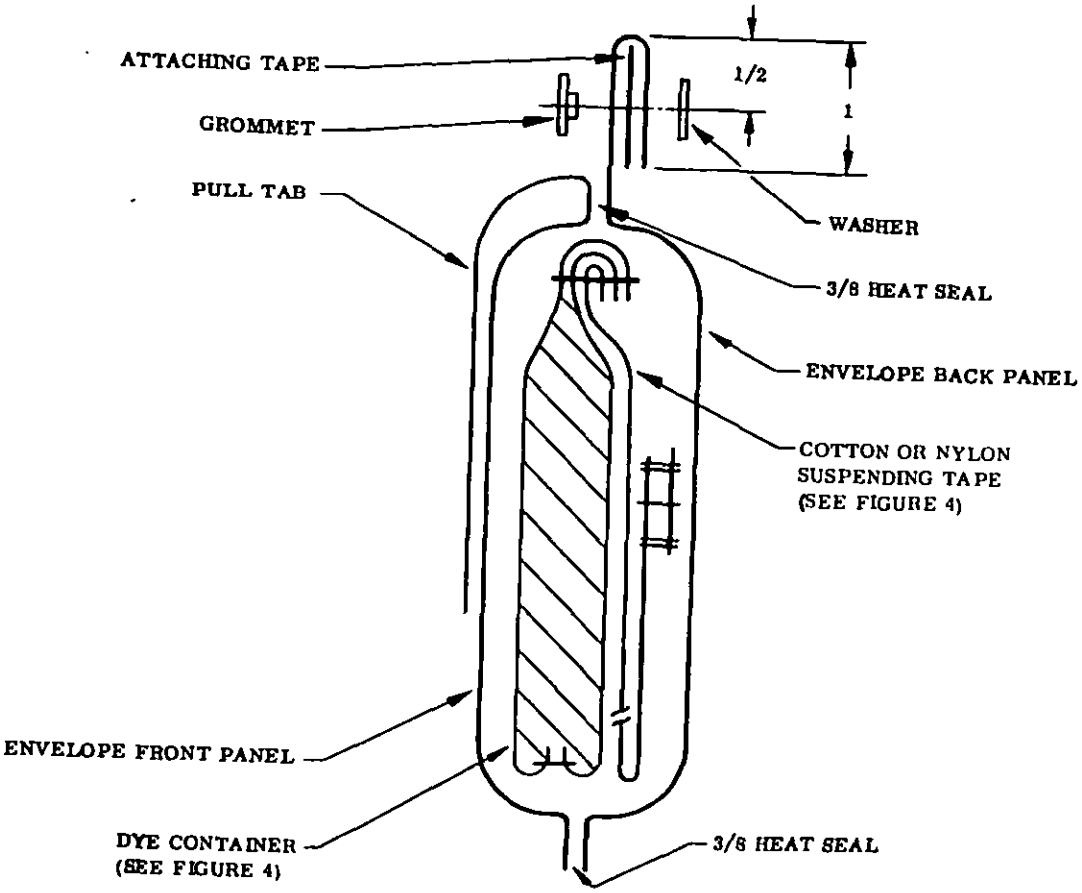
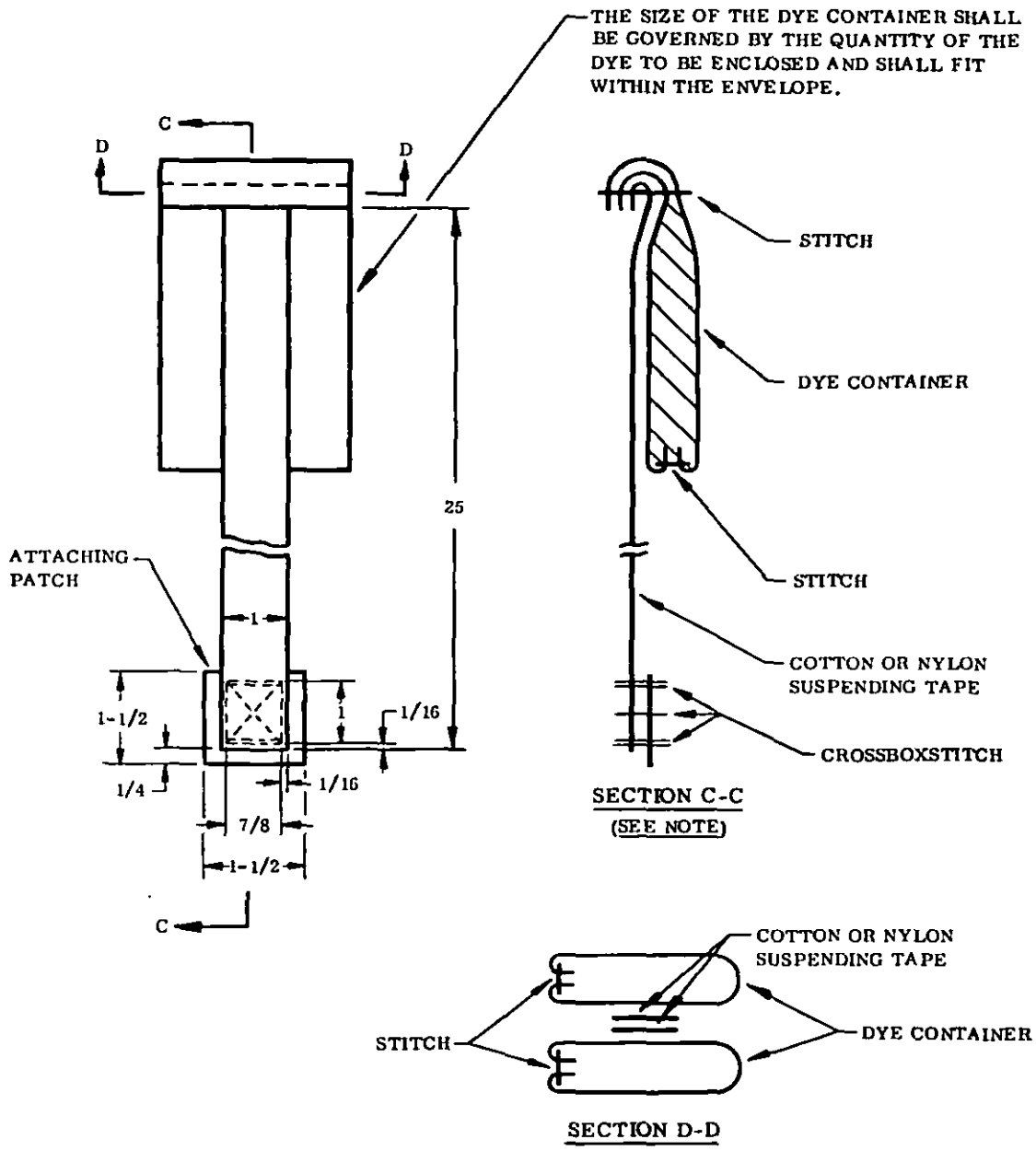


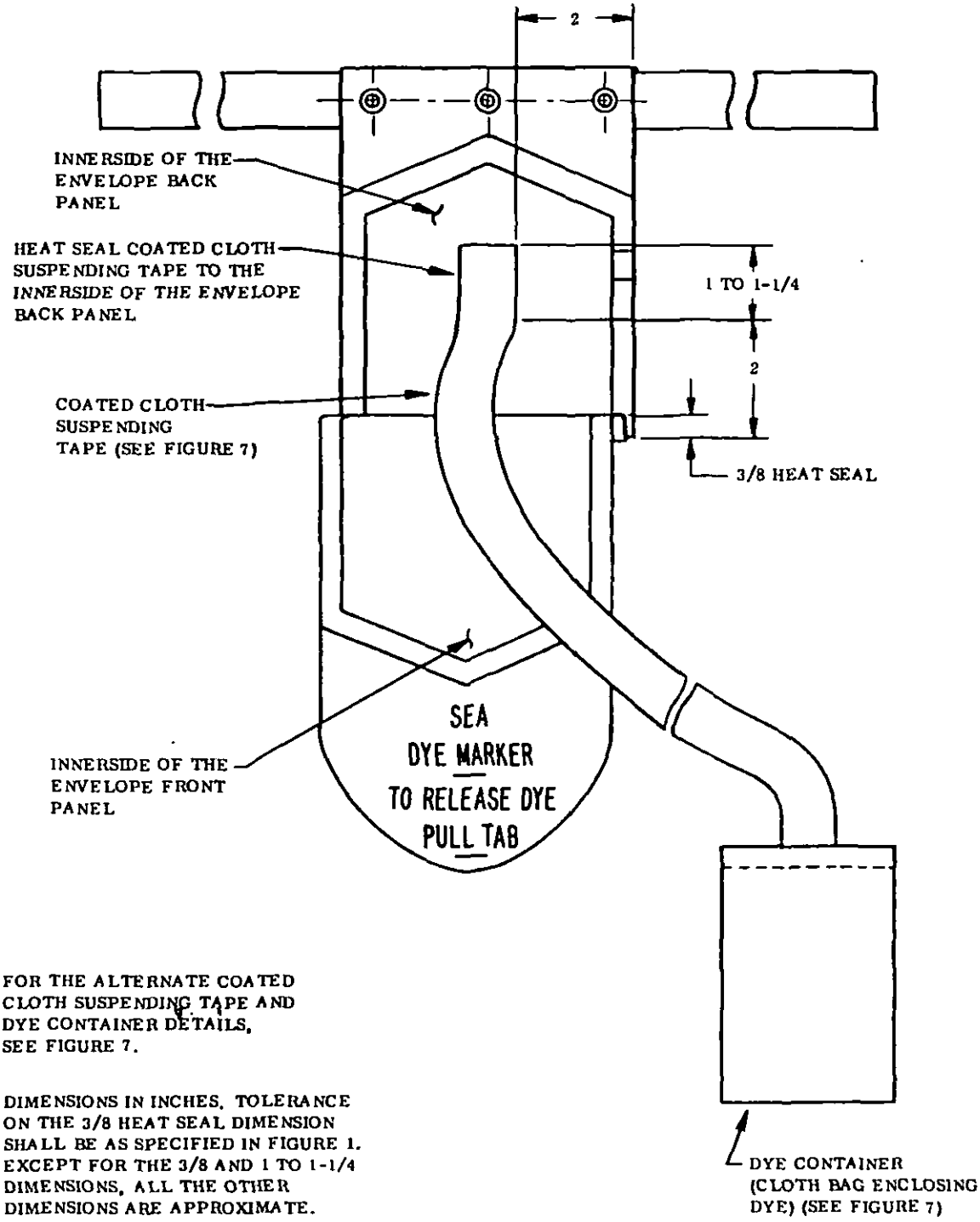
FIGURE 3. PACKET SECTIONS (COTTON OR NYLON SUSPENDING TAPE)



NOTE: *THE DYE CONTAINER MAY BE FABRICATED* FROM ONE OR TWO PIECES OF THE COTTON CLOTH, 3.2.2.2, SEWN TOGETHER ON THE TOP AND TWO SIDES OR TOP, BOTTOM, AND ONE SIDE, OR TOP, BOTTOM, AND TWO SIDES. THE CUT EDGES MAY BE ON THE INNER OR OUTERSIDE OF THE DYE CONTAINER.

DIMENSIONS IN INCHES.
TOLERANCES SHALL BE AS SPECIFIED IN FIGURE 1.

FIGURE 4. DYE CONTAINER AND COTTON OR NYLON SUSPENDING TAPE SECTIONS



FOR THE ALTERNATE COATED CLOTH SUSPENDING TAPE AND DYE CONTAINER DETAILS, SEE FIGURE 7.

DIMENSIONS IN INCHES. TOLERANCE ON THE 3/8 HEAT SEAL DIMENSION SHALL BE AS SPECIFIED IN FIGURE 1. EXCEPT FOR THE 3/8 AND 1 TO 1-1/4 DIMENSIONS, ALL THE OTHER DIMENSIONS ARE APPROXIMATE.

FIGURE 5. PACKET SHOWN OPEN FOR SHOWING METHOD OF ATTACHMENT OF THE ALTERNATE COATED CLOTH SUSPENDING TAPE

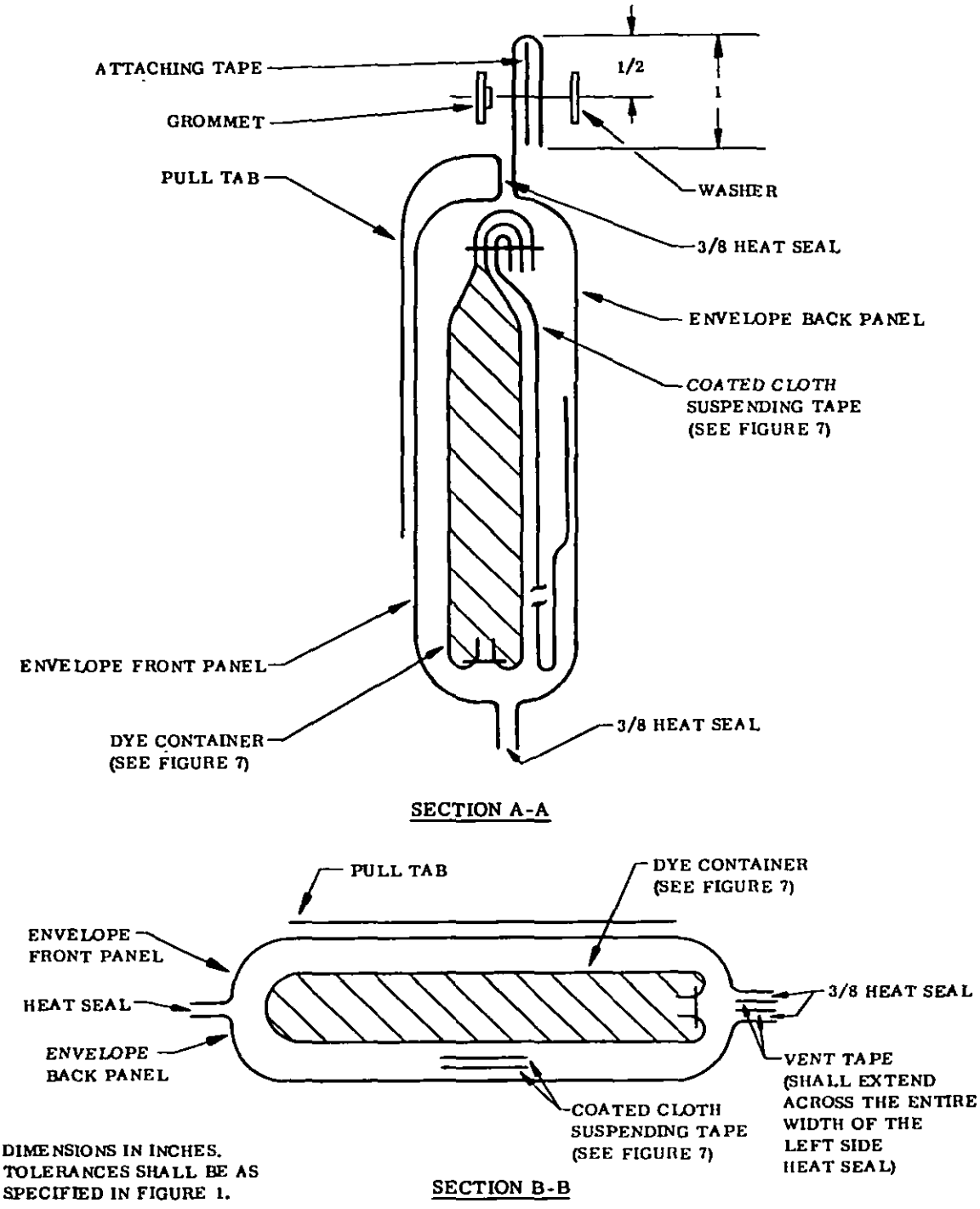
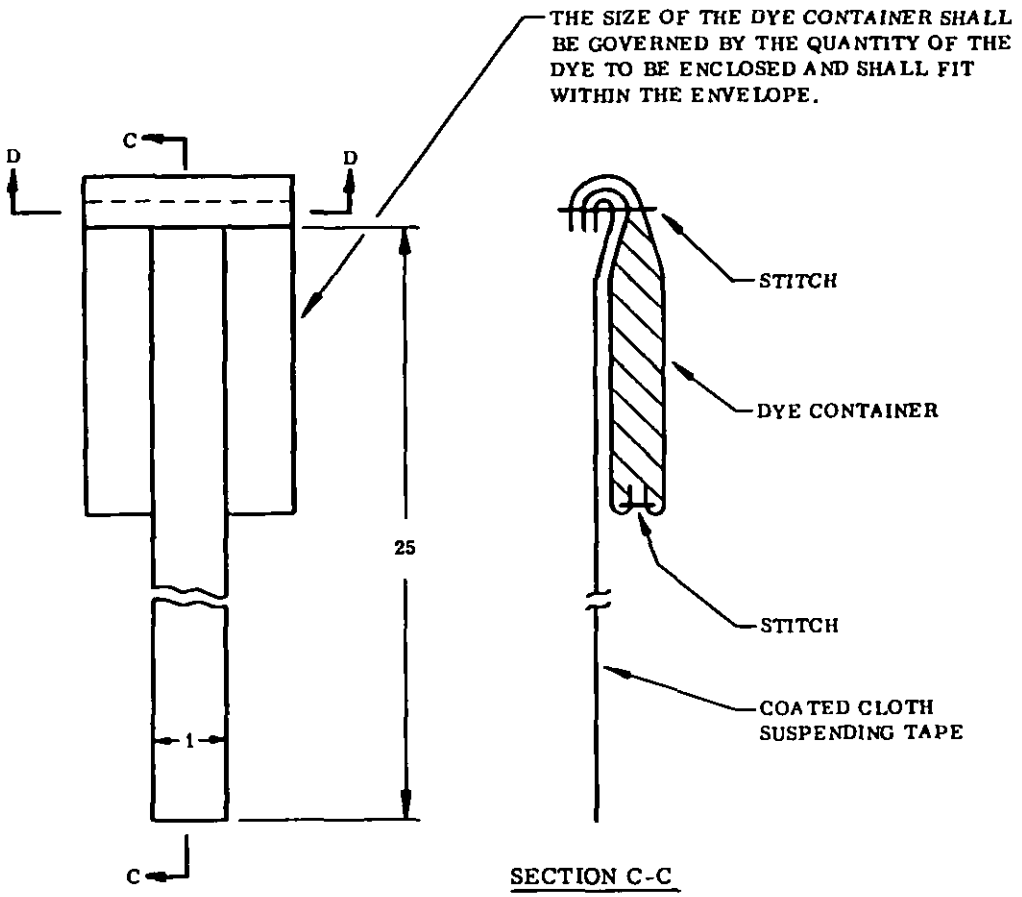
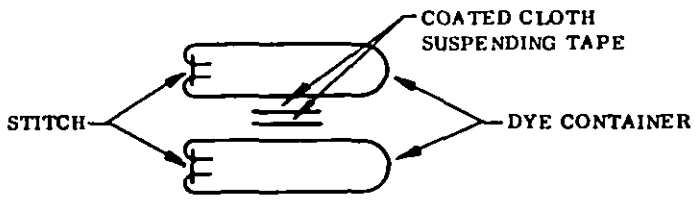


FIGURE 6. PACKET SECTIONS (ALTERNATE COATED CLOTH SUSPENDING TAPE)



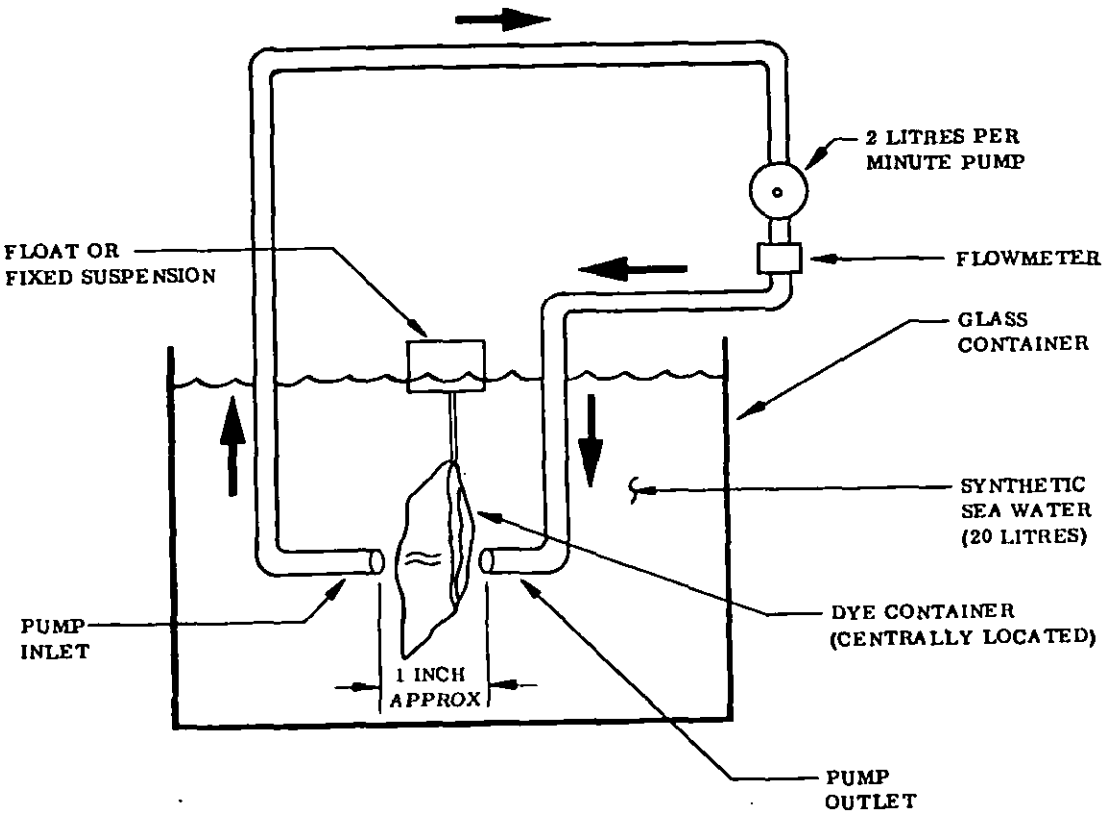
SECTION C-C
(SEE NOTE ON FIGURE 4)



SECTION D-D
(SEE NOTE ON FIGURE 4)

DIMENSIONS IN INCHES.
TOLERANCES SHALL BE AS SPECIFIED IN FIGURE 1.

FIGURE 7. DYE CONTAINER AND ALTERNATE COATED CLOTH SUSPENDING TAPE SECTIONS



THE DISTANCE BETWEEN THE DYE CONTAINER, PUMP INLET, AND THE PUMP OUTLET SHALL BE APPROXIMATELY 1/2 INCH.

FIGURE 8. RECOMMENDED METHOD OF THE PLACEMENT OF THE DYE CONTAINER IN RELATION TO THE 2 LITRE PUMP INLET AND OUTLET

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INDEX (Continued)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL	OMB Approval No. 22-R255

INSTRUCTIONS: The purpose of this form is to solicit beneficial comments which will help achieve procurement of suitable products at reasonable cost and minimum delay, or will otherwise enhance use of the document. DoD contractors, government activities, or manufacturers/vendors who are prospective suppliers of the product are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.

DOCUMENT IDENTIFIER AND TITLE: MIL-S-17980D SEA MARKER PACKET, INFLATABLE SURVIVAL EQUIPMENT

NAME OF ORGANIZATION AND ADDRESS	CONTRACT NUMBER
	MATERIAL PROCURED UNDER A ☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?
   A. GIVE PARAGRAPH NUMBER AND WORDING.

   B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID

3. IS THE DOCUMENT RESTRICTIVE?
   ☐ YES ☐ NO (If "Yes", in what way?)

4. REMARKS

SUBMITTED BY (Printed or typed name and address - Optional)	TELEPHONE NO.
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