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8 October 1975
SUPERSEDING
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MILITARY SPECIFICATION

JACKET, WET SUIT (CHLOROPRENE FOAM)

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

1. SCOPE

1.1 Scope.- This specification covers the requirements for a jacket, wet suit, fabricated from closed cell chloroprene foam.

1.2 Classification.- The jacket shall be of one type only and of the following sizes (see 6.2).

Schedule of sizes

36-37, 38-39, 40-41, 42-43, 44-45

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-F-106	- Fasteners, Slide, Interlocking
V-T-285	- Thread, Polyester
QQ-N-290	- Nickel Plating Electrodeposited
QQ-W-321	- Wire, Copper Alloy
DDD-L-20	- Labels; For Clothing, Equipage and Tentage (General Use)
PPP-B-601	- Boxes, Wood, Cleated-Plywood
PPP-B-636	- Box, Fiberboard
PPP-T-76	- Tape, Pressure-Sensitive Adhesive Paper, Water Resistant (For Carton Sealing)

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods
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
MIL-STD-417 - Rubber Compositions, Vulcanized, General Purpose, Solid (Symbols and Tests)

DRAWINGS

NAVY CLOTHING AND TEXTILE RESEARCH UNIT

16-1-178 - Jacket, Wet Suit (Chloroprene Foam); Turnlock Fastener

(Figure 2 is a miniature reproduction of Drawing No. 16-1-178 and is attached for information only.)

(Copies of specifications, standards, drawings and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

LAWS AND REGULATIONS

U.S. POSTAL SERVICE MANUAL

(Copies of the manual may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

2.2 Other publications.- The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

AMERICAN SOCIETY FOR TESTING AND MATERIALS

D-1056 - Tests for Sponge and Expanded Cellular Rubber Products

(Copies of ASTM publications may be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103).

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Application for copies should be addressed to American Trucking Associations, Attn: Tariff Order Section, 1616 P Street, N.W. Washington, D.C. 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, Illinois 60606.)

3. REQUIREMENTS

3.1 Guide sample.- Samples, when furnished, are solely for guidance and information to the supplier (see 6.3). Variations from this specification may appear in the sample, in which case the specification shall govern.

3.2 First article approval.- The requirement for first article will be as specified by the procuring activity (see 6.2).

3.3 Materials.-

3.3.1 Chloroprene Foam.- The chloroprene foam for the jackets shall be pigmented black, expanded chlorinated cellular rubber, 3/16 (± 1/32) inch (4.8 ± .8mm) thick, having a closed cell structure conforming to ASTM designation SCE41, and other requirements set forth herein when tested as specified in 4.3.1.1. It shall have a minimum density of 10 and a maximum density of 20 pounds per cubic foot (minimum density of 157.5 and a maximum density of 315 grams per cubic centimeter), with a natural skin surface on one or two sides. The foam used for the sleeve and front facings and reinforcements shall be the same as specified for the jacket except that the thickness shall be 1/8 (± 1/32 inch (3.2 ± .8mm) thick.

3.3.2 Chloroprene sheet.- The reinforcements used for the turnlock shall be a sheet of chloroprene rubber, cured with a light cloth impression finish, average 2 pounds per square yard (1.1 kg per square meter) and shall conform to the requirements for Grade SC-615 AL, BL, E3, F2, L and Z of MIL-STD-417.

3.3.3 Knitted stretch cloth.- The stretch cloth shall be circular knit from 100 percent continuous filament stretch-type nylon yarn and conform to the physical requirements of Table I when tested as specified in 4.3.1.1.

Table I - Knitted stretch cloth

Knitted stitch	Yarn per inch (min.) Wales (yarn per cm. (min)	Courses	Weight, oz. per sq.yd. (g. per sq. m.)	Elongation percent Wales	Courses	Color
Jersey	20 (7.9)	30 (11.8)	3.0 ± 0.25 (100.8 ± 7)	140 min. 200 max.	200 min. 280 max.	Black

3.3.3.1 Colorfastness.- The knitted cloth shall show fastness to laundering, crocking and perspiration equal to or better than the standard sample. When no standard sample is available, the finished material shall show a minimum of "good" fastness to laundering and perspiration, and a Munsell Value for crocking not lower than 8.5. Testing shall be as specified in 4.3.1.1

3.3.4 Lamination. - The stretch cloth shall be laminated to one side of the 3/16 inch (4.8mm) chloroprene foam by means of a suitable adhesive, or other process capable of meeting the physical requirements of the laminated foam material. If the foam has no side with a cut surface, the stretch cloth shall be laminated on any side. When foam has a cut surface on one side the stretch cloth shall be laminated to the cut side. The adhesive used shall be non-toxic, non-irritant and free from objectionable odor. The fabric backed (laminated) side shall be smooth and free of wrinkles or puckers, and show no signs of blocking, tackiness or adhesive strike-through. The 1/8 inch (3.2 mm) thick foam shall not be laminated with the stretch cloth.

3.3.4.1 Laminated foam.- The finished laminated foam material shall conform to Table II when tested as specified in 4.3.1.1.

Table II - Laminated foam

Characteristic	Requirement
Compression set, % maximum	35
Compression deflection, psi (g/cm^2)	2.0 min (139) 7.0 max (486.5)
Accelerated aging shrinkage, % maximum in each direction	5.0
Water absorption, % maximum	15.0
Laundering resistance	No delamination
Adhesion, original, lbs (kgs) minimum, per two inches (50.8mm)	6.0 (2.7)
Adhesion after launderings. lbs (kgs) minimum, per two inches (50.8mm)	6.0 (2.7)
Adhesion after aging, lbs. (kgs) Minimum, per two inches (50.8mm)	6.0 (2.7)
Blocking	No blocking

3.3.5 Thread, polyester.- The thread used for sewing the slide fastener shall conform to type II, class 1, 4-ply, letter size F of V-T-285. The color of the thread shall be Black AA, Cable No. 66043.

3.3.5.1 Colorfastness.- The dyed thread shall show fastness to laundering, perspiration and light equal to or better than the standard sample when tested as specified in V-T-285. When no standard sample is available, the dyed thread shall show a minimum of "good" fastness to laundering, perspiration and light when tested as specified in V-T-285.

3.3.6 Turnlock fastener.- The turnlock fastener for engaging the crotch piece (beaver tail) shall consist of a clinch type stud, a clinch plate, a prong type eyelet and eyelet washer and conform to styles XB-78333, BS-78507, BS-78403 and BS-78505 respectively, manufactured by Dot Products Supply Company, Newtonville, MA 02160 or a functionally interchangeable equivalent. Prior to use of a functionally interchangeable equivalent item, the supplier shall submit the item to the contracting officer with supporting data for approval. All components shall be of brass for "marine use" with a nickel plated finish conforming to class 1, type V of QQ-N-290. The turnlock shall have a "phosphorous" bronze spring wire and shall conform to alloy number 510 of QQ-W-321 (see Figure 2).

3.3.7 Slide fasteners.- The slide fastener for the front opening and sleeve cuffs shall conform to Table III. The metal parts shall be of nickel silver and conform to the requirements of V-F-106.

Table III - Slide fasteners

Location	Type	Style	Size	Length	Jacket size	Pull-Tab
Front opening	IV	8	MH	25 inches (635mm)	36 to 41	Long tab
				26 inches (660mm)	42 to 45	Long tab
Sleeve cuff	I	3	M	9 inches (228mm)	All sizes	Short tab

3.3.7.1 Tape.- The tape for the slide fasteners shall be cotton or cotton warp and nylon filling, twill or plain weave, waterproof and mildew resistant treated as specified in V-F-106. The extension beyond the scoops shall be a minimum of 1 3/8 inches (34.9mm). All pull tabs shall be provided with a thong made of nylon tape or webbing. The color of both the tape and thong shall be black.

3.3.8 Adhesive cement.- The cement used to seal the seams shall be a chloroprene compound and shall conform to the requirements specified herein when tested as specified in 4.3.1.1.

3.3.9 Marking.- The marking shall be applied on each jacket with a yellow marking medium conforming to type IV, class 1 of DDD-L-20. Marking shall be applied to the inside back of jacket, centered between the shoulder seams approximately two inches (50 mm) down from the neck opening. The marking shall be permanent and shall not run, bleed, or rub off when tested as specified in 4.3.1.1. The inscription shall read as follows:

JACKET, WET SUIT (CHLOROPRENE FOAM)
CONTRACT NO: DSA-100-00-0-000 (EXAMPLE)
STOCK NO: 4220-00-000-0000 (EXAMPLE)
SIZE: 38-39 (EXAMPLE)
NAME OF SUPPLIER:

3.3.9.1 Special marking.- A white paper label printed or stamped with black block letters 1/8 inch (3.2 mm) high for capital letters and 1/16 inch (1.6mm) high for lower case letters bearing the following information shall be placed inside each jacket inside the right arm sleeve.

"To prolong the life of the jacket, observe the following instructions for care and handling:

1. Be sure all zippers are fully open before donning.
2. Do not pull and tug on jacket or the chloroprene foam may tear or split at the seams.
3. To remove turn jacket inside out.
4. After each use, wash with fresh water and apply silicone or petroleum jelly on the slide fasteners.
5. Allow jackets to dry before storage.
6. Do not fold or crease in storage."

3.4 Design.- The jacket shall be made of laminated closed cell chloroprene foam material (see 3.3) and shall have a high collar, offset sleeves, and attached crotch piece, a nickel silver slide fastener at the front opening and wrist inseams. Nickel plated swivel locks shall be used for securing the crotch piece. Each swivel lock shall be reinforced and the slide fasteners shall be cemented, stitched and backed with a light-weight unsupported chloroprene foam (see Figure 1).

3.4.1 Figures.- Figures are furnished for information purposes only. To the extent of any inconsistencies between the written specification and the figures, the written specification shall govern.

3.5 Patterns.- Standard patterns will be furnished by the Government (see 6.3). The standard patterns shall not be altered in any way and are to be used for cutting the supplier's working patterns. The working patterns shall be identical to the standard patterns.

3.5.1 Pattern parts.- The component parts of the jackets shall be cut from the material specified in accordance with the following pattern parts:

Material	Nomenclature of pattern parts	Cut parts
Laminated foam	Front	2
	Back	1
	Sleeve	2
Unsupported foam	Front facing (right side)	1
	Sleeve facing	2
	Underarm reinforcement	2
	Side seam reinforcement	2
Cured chloroprene rubber	Turnlock reinforcement	8

3.6 Construction.-

3.6.1 Stitch, seam and stitching types.- Stitch, seam, and stitching types specified in Table IV shall conform to FED-STD-751.

3.6.2 Thread breaks and ends of seams.- The ends of stitching on the slide fastener shall be securely tacked or backstitched not less than 3/8 inch (9.5mm). Thread breaks shall be secured by stitching back of the break not less than 1/2 inch (12.7mm).

3.6.3 Stitches per inch.- The minimum and maximum number of stitches per inch shall be as specified in Table IV.

3.6.4 Cemented seams.- The cemented seams shall have a minimum breaking strength of 28 pounds per two inches (12.6 kg per 50.8mm) when tested as specified in 4.3.1.1.

3.7 Manufacturing requirements.- The jacket shall be manufactured in accordance with the operation requirements specified in Table IV. The supplier is not required to follow the exact sequence of operations listed provided that the finished jackets are identical to that produced by following the sequence of operations as listed in Table IV. The smooth natural skin side of the foam rubber shall be used as the face of the material and shall be on the outside.

Table IV - Construction of jackets

No.	Description of Operation	Stitch Type	Seam and Stitching Type	Stitches Per Inch	Thread	
					Needle	Bobbin or Looper
1.	Cutting of laminated foam material The jacket shall be cut in accordance with patterns furnished which shall show size, shape and markings for proper assembly of all component parts.					
2.	Replacement of damaged components During the spreading, cutting and manufacturing process, components having material defects or damages that are classified as defects in Section 4, shall be removed from production and replaced with non-defective and properly matched components.					
3.	Part markings a. All parts of the basic material shall be marked or ticketed to insure proper assembly and size. b. The use of metal fastening devices or sewn-on tickets is prohibited. c. The use of ink pad numbering machine, rubber stamp or pencil is allowed providing the numbering does not show on the outside of the jackets.					
4.	Preparing components for assembly a. Apply two coats of chloroprene cement to all areas to be abutted, reinforced, or stitched, 24 hours prior to assembly. b. Apply two additional coats of chloroprene cement to all areas to be abutted, reinforced, or stitched, after the 24 hour perios. (No solvent is required on seams.)					

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Table IV - Construction of jackets (cont d)

No.	Description of Operation	Stitch Type	Seam and Stitching Type	Stitches Per Inch	Thread	
					Needle	Bobbin or Looper
4.	Preparing components for assembly (cont'd) c. The abutted seams shall be overcoated 1/4 (+ 1/16) inch (6.4 + 1.6mm) beyond seams on the outside and on the inside of the jacket.					
5.	Join the slide fastener to sleeve cuff opening a. Cement the closed slide fastener tapes to the inside bottom of left and right sleeve openings as indicated by marks on the pattern. The stops at the top of slide fasteners shall be approximately 1 1/2 inches (38mm) from the sleeve opening. b. Care shall be exercised not to apply cement on scoops of slide fasteners. c. Double stitch 3/16 to 1/4 inch (4.8 to 6.4mm) gauge, the tapes of slide fasteners with the inner row of stitching approximately 3/8 inch (9.5mm) from the chain edge and continued across the bottom of slide fastener.	301	SSaa-2	3-4	F/4	F/4
6.	Join right half of slide fastener with retainer on the underside of right front of jacket a. Cement the tape of the right half of slide fastener with the retainer to edge of right front opening. b. Care shall be exercised not to apply adhesive on scoops of slide fasteners.					

Table IV - Construction of jackets (cont'd)

No.	Description of Operation	Stitch Type	Seam and Stitching Type	Stitches Per Inch	Thread	
					Needle	Bobbin or Looper
6.	Join right half of slide fastener with retainer on the underside of right front of jacket (cont'd)					
	c. Double stitch, 3/16 to 1/4 inch (4.8 to 6.4 mm) gauge, the tape of slide fastener with the inner row of stitching nearest the chain edge approximately 3/8 inch (9.5mm) from the chain edge. The bottom of slide fastener shall be even with the bottom of the front closure.	301	SSaa-2	3-4	F/4	F/4
7.	Join left half of slide fastener with separating pin on the underside edge of left front opening					
	a. Cement the tape of the left half of slide fastener with the operating pin to the edge of left front opening.					
	b. Care shall be exercised not to apply adhesive on scoops of slide fastener.					
	c. Double stitch, 3/16 to 1/4 inch (4.8 to 6.4 mm) gauge, the tape of slide fastener, with the inner row of stitching nearest the chain edge, approximately 3/8 inch (9.5mm) from the chain edge. The bottom of slide fastener shall be even with the bottom of the front when closed.	301	SSa-2	3-4	F/4	F/4
8.	Attach turnlock fastener					
	a. Cement 8 reinforcing pieces on top and bottom surfaces of the jacket (two on each position) indicated by marks on patterns.					

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Table IV - Construction of jackets (cont'd)

No.	Description of Operation	Stitch Type	Seam and Stitching Type	Stitches Per Inch	Thread	
					Needle	Bobbin or Looper
8.	Attach turnlock fastener (cont'd) b. Secure an eyelet on the top surface and a washer on the underside of each front, through the reinforcement pieces. (Cut a hole through the center of the finished eyelet.) c. Secure the turnlock (studs) on the top surface and a clinch plate on the underside of the beaver tail, through the reinforcement pieces.					
9.	Assembly instructions a. Insure that all seams to be cemented are cleaned of foreign matter and are tacky prior to joining. b. Allow more time for curing on actual curves prior to the next step of joining.					
10.	Assembly a. Cement (abut) the fronts and backs at shoulder; start at the top of neck and work toward the armhole opening as indicated by marks on pattern. b. Cement (abut) sleeve cap to armhole opening. c. Cement (abut) side and sleeve seams. d. Turn garment inside out.					

Table IV - Construction of jackets (cont'd)

No.	Description of Operation	Stitch Type	Seam and Stitching Type	Stitches Per Inch	Thread	
					Needle	Bobbin or Looper
10.	Assembly (cont'd) e. Cement the sleeve facings over the slide fasteners approximately 1 1/2 inches (38mm) from edge of scoops. The smooth or uncut surface of the facings shall face toward the body when worn and shall be lapped over the slide fasteners towards the front of the sleeves. f. Cement the unsupported foam material reinforcement patch on underarm crotch, equally spaced and centered over the side and sleeve seams. g. Cement the unsupported foam material patches centered over the bottom end of side seams of jacket. h. Cement facings on the right front opening along the inner edge of slide fastener tape approximately 1 1/2 inches (38mm) from edge of scoops. The smooth surface of the facings shall face toward the body when worn.					
11.	Turn garment outward.					
12.	Slit (cut) the sleeve openings 7 (+ 1/2) inches (177.8 + 12.7 mm) centered on the slide fasteners.					
13.	Markings Markings shall be applied as specified in 3.3.9.					
14.	Cleaning a. Trim all thread ends. b. Remove all loose threads. c. Remove all spots, stains and excessive cement without injury to the material.					

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3.8 Sizes and measurements.- The sizes and measurements of the finished jackets shall be as shown in Table V. All measurements and tolerances are expressed in inches and millimeters.

Table V - Sizes and measurements

Size	A Total Length	B Chest	C Bottom	D Sleeve Inseam
36-37	42 1/2 (1080)	35 (889)	36 (914)	17 1/8 (435)
38-39	43 (1092)	37 (940)	38 (965)	17 3/8 (441)
40-41	43 1/2 (1105)	39 (991)	40 (1016)	17 5/8 (448)
42-43	44 (1118)	41 (1041)	42 (1067)	17 7/8 (454)
44-45	44 1/2 (1130)	43 (1092)	44 (1118)	18 1/8 (460)
Tolerance	± 1/2 (12.7)	± 1/2 (12.7)	± 1/2 (12.7)	± 1/2 (12.7)

NOTE: The measurements shall be taken with the jacket laid flat and face up in a relaxed condition with the front slide fastener closed. A, B, C and D refer to Figure 1.

A. Length.- Length shall be measured from top of neck of jacket in a line perpendicular to the bottom of beaver tail.

B. Chest - Double the measurements taken across the front of jacket approximately 2 inches below the armhole seam.

C. Bottom - Double the measurements taken across the bottom of jacket from side seam to side seam.

D. Sleeve Inseam - Measured from underarm seam in a line perpendicular to the bottom of sleeve opening.

3.9 Workmanship.- The finished jackets shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

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 the prescribed requirements.

4.1.1 Certificate of compliance.- Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 First article inspection.- When required, the first article submitted in accordance with 3.2 shall be inspected, as specified in 4.3.2, for compliance with design, construction, workmanship, appearance, and dimensional requirements.

4.3 Inspection.- Inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated.

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

4.3.1.1 Testing of components.- In addition to the quality assurance provisions of the referenced specifications, components listed in Table VII shall be tested for the characteristics shown therein. The tests shall be performed on specially prepared cemented seams, similar to those made on the end item. The methods of testing specified in FED-STD-191 wherever applicable and as specified herein shall be followed. All test reports shall contain the individual values utilized in expressing the final result. The sample size shall be in accordance with Table VI and the lot shall be unacceptable if one or more units fail to meet any requirements specified. The basis for lot size for laminated and unlaminated chloroprene foam shall be one sheet, and one yard full width for the knitted stretch fabric. The sample unit for testing shall be as follows:

Unlaminated foam - one square yard (.8 square meter)
Laminated foam - one sheet (.9 meter)
Knitted stretch fabric - one yard full width

Table VI - Sample size

Lot size	Sample size
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

Table VII - Testing of components

Component	Characteristic	Requirement Paragraph	Test Method
Chloroprene foam	Material identification	3.3.1	1/
	Color	3.3.1	Visual 2/
	Thickness	3.3.1	ASTM-D1056 3/
	Density	3.3.1	4.3.1.1.1
Knitted stretch cloth	Material identification	3.3.3	1/
	Filament	3.3.3	1/
	Weight	3.3.3	5040
	Wales and courses/inch (cm)	3.3.3	5070
	Elongation	3.3.3	4.3.1.1.2
	Color	3.3.3	Visual 2/
	Colorfastness:		
	Laundering	3.3.3.1	5614
	Crocking	3.3.3.1	5651
	Perspiration	3.3.3.1	5680
Laminated foam	Compression set	3.3.4.1	ASTM-D1056 4/
	Compression deflection	3.3.4.1	ASTM-D1056
	Shrinkage after accelerated aging	3.3.4.1	4.3.1.1.3
	Water absorption	3.3.4.1	4.3.1.1.4
	Laundering resistance	3.3.4.1	5556 6/
	Adhesion:		
	Initial	3.3.4.1	5950 5/
	After 3 launderings	3.3.4.1	5556 and 5950 5/ 6/
	After aging	3.3.4.1	4.3.1.1.3 and 5950 5/
	Blocking	3.3.4.1	5872 7/
Markings	Permanency	3.3.9	4.3.1.1.5
Adhesive cement	Material identification	3.3.8	1/
Cemented seam	Breaking strength	3.6.4	5100 8/

1/ A certificate of compliance will be accepted as evidence of conformance with this requirement.
2/ One determination shall be taken for this requirement.
3/ Thickness - Except that 5 determinations shall be made.
4/ Compression set - Test shall be run at room temperature for 22 hours with a recovery time of 24 hours.
5/ Adhesion - Except that the distance between the clamps shall be one inch at the start of the test. The use of a suitable solvent (e.g., MEK) to help separate the fabric from the foam sufficiently to fit the clamps is permissible. The adhesion shall be tested in the fabric's length (wale) direction only.
6/ Laundering - Except that five 8 by 8 inches (203 by 203 mm) specimens shall be tested and three cotton laundering cycles performed.
7/ Blocking - Except specimens 4 by 4 inches (102 by 102mm) shall be placed together fabric side to fabric side.

8/ Cemented seam strength - The cemented seams shall be centered equidistant from the clamps. All breaks shall be made with the seam at right angles to load direction. The clamps shall be one inch (25.4mm) apart at the start of the test and the face of each jaw shall be not less than 1 by 2 inches (25.4 by 50.8mm). The cemented seam test specimen shall be rectangular, 2 inches (50.8mm) wide by not less than 6 inches (152.4mm) long.

4.3.1.1.1 Density.- Five specimens each 2 inches (50.8mm) square shall be weighed separately to the nearest 0.001 gram on an analytical balance. The thickness of each specimen shall be determined in accordance with ASTM method D1056 and the following formula shall be used to determine density.

$$D = \frac{0.95 \times W}{T}$$

Where D = density in lbs/ft^3
W = the sum of the weights of the 5 specimens (grams)
T = the sum of the thickness of the 5 specimens (inches)

4.3.1.1.2 Elongation.- An incline plane type of machine (i.e., I-P-4 or similar type) with a suitable autographic recording device shall be used. Specimens of the fabric shall be cut 4 by 6 inches (102 by 152mm) with the long direction parallel to the direction to be tested. The specimen shall be evenly aligned without tension or slack in the 1 by 3 inch (25.4 by 76.2mm) clamps set two inches (50.8mm) apart. The machine shall run through two complete cycles, proceeding to its maximum depression so as to exert a five pount (2.25kg) tension. Five specimens, each containing different wales and courses shall be tested, using individual recorded elongation graphs. The average stretch of five specimens for each direction shall be measured at the peak of the last recorded cycles, in a line perpendicular to the horizontal zero axis and reported to the nearest percent.

4.3.1.1.3 Accelerated aging.- Three square specimens each with a minimum dimension of 8 by 8 inches (203.2 by 203.2mm) shall be measured to the nearest 1/32 inch (.8mm) in both length and width direction by means of a steel rule. The specimens shall be suspended vertically in an air-oven at 158 degrees F (± 2 degrees F) (70°C ± 1°C)for seven days. At the conclusion of the aging interval, the specimens shall be cooled at room temperature on a flat surface and allowed to rest at least 4 hours before determination of shrinkage. The average shrinkage in each direction shall be calculated as follows and reported to the nearest 0.1 percent.

$$\text{Percent shrinkage} = \frac{O-A \times 100}{O}$$

Where O = original length or width (inches) (mm)
A - length or width after aging (inches) (mm)

4.3.1.1.4 Water absorption.- Three specimens each 4 by 6 inches (101.6 by 152.4mm) shall be weighed separately on an analytical balance to the nearest 0.1 gram. The specimens shall be placed in a tumble jar apparatus (as described in TM-5500 of FED-STD-191) containing two liters of distilled water and rotated for 20 minutes. At the end of the rotating period, the specimens shall be immediately removed from the water without pressure blotted dry of surface water with filter paper or other absorbent material and weighed. The average percent water absorption shall be calculated as follows and reported to the nearest 0.1 percent.

$$\text{Water absorption percent} = \frac{W2-W1 \times 100}{W1}$$

Where W1 is weight of specimen before immersion
W2 is weight of specimen after immersion

4.3.1.1.5 Marking test.- The marking shall be tested by rubbing a wet white cotton print cloth across the markings six times using normal pressure. There shall be no staining of the cotton cloth. The markings shall be complete in all details as specified in regard to correctness, completeness, legibility and location. Any of the above attributes that are not as specified shall be classified as a defect.

4.3.2 Examination of the end item.- Examination of the end item shall be in accordance with 4.3.2.1 and 4.3.2.2. The applicable inspection levels and acceptable quality levels (AQL's) shall be as indicated in 4.3.2.3. The sample unit shall be one finished jacket. The lot size shall be expressed in units of one jacket.

4.3.2.1 Visual examination.- The jacket shall be examined for defects in color, design, material, workmanship and marking and the defects classified in accordance with the list below:

Defect	Classification Major	Minor
MATERIAL DEFECTS AND WORKMANSHIP DAMAGES		
a. Any hole	X	
b. Deep creases or fold lines	X	
c. Needle chew	X	
d. Cut, tear or mend	X	
e. Unsightly cement mass (other than on fastener chain)		X
BASIC MATERIAL		
a. Any evidence of delamination	X	
b. Any brittle area which cracks when bent	X	
c. Area of excess cement, e.g., solid runs, ridges		X

Defect	Classification Major	Minor
BASIC MATERIAL (cont'd)		
d. Chloroprene foam or cement tacky	X	
e. Any imbedded foreign material easily removed resulting in damage to basic material	X	
f. Any imbedded foreign matter not easily removed, but if removable, does not damage basic material		X
g. Any blister or pin hole	X	
h. Mottled, cloudy or streaky finish		X
i. Any objectionable odor		X
j. Reinforcement pieces omitted or misplaced	X	
CLEANNESS		
a. Excessive cement on [illegible]in of fastener	X	
b. One or more spots o [illegible]ins of an obvious permanent nature		X
c. Thread ends not trimmed or loose thread ends not removed from jacket (to be scored only when the condition exists or major portion of jacket)		X
COMPONENTS AND ASSEMBLY		
Any component part omitted or any required operation omitted or improperly performed (unless otherwise classified herein)	X	
CUTTING		
Any component part not cut in accordance with marks indicated on pattern or not in accordance with specification requirements	X	
SEAMS AND STITCHING		
a. Stitching omitted	X	
b. Part of garment caught in any unrelated stitching operation	X	
c. Not specified seam or stitch type		X
d. Less than or more than the required stitches per inch (mm)		X
e. Open seam	X	
f. Thread breaks not secured or stitching back of the break less than 1/2 inch (12.7mm)		X
g. Ends of stitching on slide fastener not securely tacked or backstitched less than 3/8 inch (9.5mm)		X

Defect	Classification Major	Minor
CEMENTED SEAMS		
a. Any open seam	X	
b. Uneven seam		X
c. Twisted or puckered seam	X	
d. Seam not properly joined	X	
MARKING AND SPECIAL MARKING		
a. Omitted, incorrect or illegible	X	
b. Color not as specified		X
c. Marking not permanent		X
METAL COMPONENTS		
Turnlock fastener		
a. Not specified type, size, color or metal finish	X	
b. Any specified hardware or component thereof missing, broken, bent with sharp or rough edge, deformed or otherwise defective not permitting proper function	X	
c. Any part not properly set or attached to a degree where it becomes detached from assembly	X	
d. Any part not properly set or attached but will adequately be retained on assembly and will function as intended		X
e. Any hardware incomplete	X	
f. One or more clinched too tightly cutting surrounding fabrics	X	
NOTE: Clinch type studs and eyelet shall be checked for proper function and secure clinching by opening and closing fasteners several times.		
Slide fastener		
a. Not specified type, size, color or metal finish	X	
b. Other than cotton or cotton/nylon tape	X	
c. Tape stitched too loose or too tight, causing a noticeable bulge on tape or opening, when closed	X	
d. Stitching too close to chain edge not permitting slides to pass	X	

Defect	Classification Major	Minor
METAL COMPONENTS (cont'd)		
Slide fastener (cont'd)		
e. Ends of chain uneven by:		
1. 1/4 inch (6.4mm) or more but not more than 1/2 inch (12.7mm)		X
2. More than 1/2 inch (12.7mm)	X	
f. Chain length of slide fasteners not as specified in Table III by:		
1. 1/2 inch (12.7mm) or more but not more than 1 inch (25.4mm)		X
2. More than 1 inch (25.4mm)	X	
g. Tabs not provided with thongs		X
h. Thongs not made of nylon tape or webbing		X
NOTE: Slide fasteners shall be checked for proper function by opening and closing slide fastener at least three times.		
Front closure (slide fastener)		
a. Slide fastener set too high leaving a space between end of retainer or separating pin and base of opening of slide fastener	X	
b. Closed opening; twisted, puckered, or bulging	X	
c. Slide fastener tape stitched to left or right front edge with one row of stitching	X	
d. Chain exposed beyond left or right front edge (score only when the condition exists along major portion of chain)		X
e. Closed front uneven by:		
1. 1/4 inch (6.4mm) or more but not more than 3/8 inch (9.5mm)		X
2. More than 3/8 inch (9.5mm)	X	
f. Front facing short, tight or twisted causing fullness on front opening		X
g. Facing not extending full length of front closure	X	

Defect	Classification Major	Minor
METAL COMPONENTS (cont'd)		
Sleeve closure (slide fastener)		
a. Slide fasteners on one or both sleeve openings omitted	X	
b. Closed slide fastener twisted, puckered or bulging	X	
c. Slide fastener stitched to sleeve with one row of stitching	X	
d. Sleeve facings omitted	X	
e. Sleeve facings tight or twisted causing fullness on sleeve opening	X	
f. Sleeve facings not lapped over slide fastener as specified		X
g. Cement missing	X	
h. Sleeve not slit over center of fastener		X
i. Sleeve slit less than 6 1/2 inches (165.1mm)		X
j. Sleeve slit more than 7 1/2 inches (190.5mm)	X	

4.3.2.2 Dimensional examination.- The jacket shall be examined for defects in dimensions in accordance with the following:

a. Any measurement deviating from nominal dimensions and tolerances specified shall be scored as a measurement defect.
b. Sleeve lengths unequal in length by 1/2 inch (12.7mm) or more shall be scored as a size measurement defect.

4.3.2.3 Inspection levels and acceptable quality levels.- The inspection levels and acceptable quality levels (AQL's) expressed as defects per 100 units, for visual and dimensional examinations shall be as follows:

	AQL's	Inspection level
For examination in 4.3.2.1:		
Major	2.5	II
Total (Major and Minor combined)	6.5	II
For examination in 4.3.2.2:		
One class	6.5	S-3

4.3.3 Examination of preparation for delivery.- An examination shall be made to determine that packaging, packing, and marking comply with the Section 5 requirements of the specification. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully prepared for delivery except that it need not be sealed. Defects of closure listed below shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the AQL shall be 2.5 defects per 100 units.

Examine	Defect
Marking (exterior and interior)	Omitted, incorrect, illegible, of improper size, location, sequence or method of application.
Materials	Any component missing, damaged or not as specified.
Workmanship	Inadequate application of components, such as incomplete closure of container flaps, improper taping, loose strapping or inadequate stapling; bulging or distortion of container.
Content	Number of jackets per shipping container is more or less than required. 1/ Size shown on one or more jackets not as specified on package or outer containers. 1/

1/ For this defect, two shipping containers in the sample shall be examined.

5. PREPARATION FOR DELIVERY

5.1 Packaging.- Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A.- Each jacket shall be laid back down with the sleeves fully extended and the crotch piece turnlocks fastened. Each armhole, shoulder, and upper arm area shall be stuffed with rolled or crumpled tissue wrapping paper having a basis weight (24 x 36-480) of 10 pounds (4.5 kg) per ream. All slide fasteners shall be closed. Each jacket shall be individually boxed in a fiberboard box conforming to style FTC, type CF, variety SW, class weather-resistant of PPP-B-636. The staples on the inside of the box body shall be covered with pressure sensitive tape to prevent abrading the jacket. The jacket shall be placed in the box front down with the sleeves folded over the back full length, one adjacent to the other. Inside dimensions of each box shall approximate 36 inches (914.4mm) in length, 22 inches (558.8mm) in width and 4 1/2 inches (114.3mm) in depth. Approximate dimensions are furnished as a guide only. The box closure shall be secured with minimum 3 inch (76.2mm) width gummed paper tape conforming to PPP-T-76 applied at the center of the length opening and extending across the bottom and up the sides at least 3 inches (76.2mm).

5.1.2 Level C (Commercial Packaging).- Jackets shall be packaged to afford adequate protection against physical damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice when it meets this requirement.

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

5.2.1 Level A.- Six jackets, of one size only, packaged as specified in 5.1, shall be packed flat in a close fitting box conforming to PPP-B-601, overseas type, grade B, style optional. Strapping roll is zinc coated.

5.2.2 Level B.- Six jackets, of one size only, packaged as specified in 5.1, shall be packed in a fiberboard shipping container conforming to class weather-resistant, style RSC, grade V2s of PPP-B-636. Level A packages shall be packed flat, one in length, one in width, and six in depth within the shipping container. Inside dimensions of each shipping container shall approximate (guide only) 37 inches (939.8mm) in length, 23 inches (584.2mm) in width and 27 1/2 inches (698.5mm) in depth. Each shipping container shall be closed, waterproofed, and reinforced in accordance with the appendix of PPP-B-636.

5.2.3 Level C (Commercial Packing).- Jackets, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. The quantity per shipping container shall be the same as that normally used by the supplier for retail distribution. Containers shall comply with U.S. Postal Service Manual, Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.3 Marking.- In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use.- The foam jacket is intended to be worn with the trousers, hood, mitten and bootee components of a wet-suit which is designed to protect personnel against the effect of cold water immersion.

6.2 Ordering data.- Procurement documents should specify the following:

a. Title, number and date of this specification.
b. Sizes required (see 1.2).
c. Whether first article sample is required (see 3.2).

d. Selection of applicable levels of packaging and packing (see 5.1 and 5.2).

6.3 Samples and patterns.- For access to samples and patterns, address the procuring activity issuing the invitation for bids.

Custodian:
Navy - SA

Review activities:
Navy - MS
DSA - CS

User activities:
Navy - AS, OS

Preparing Activity:
Navy - SA

Project No. 8415-0871

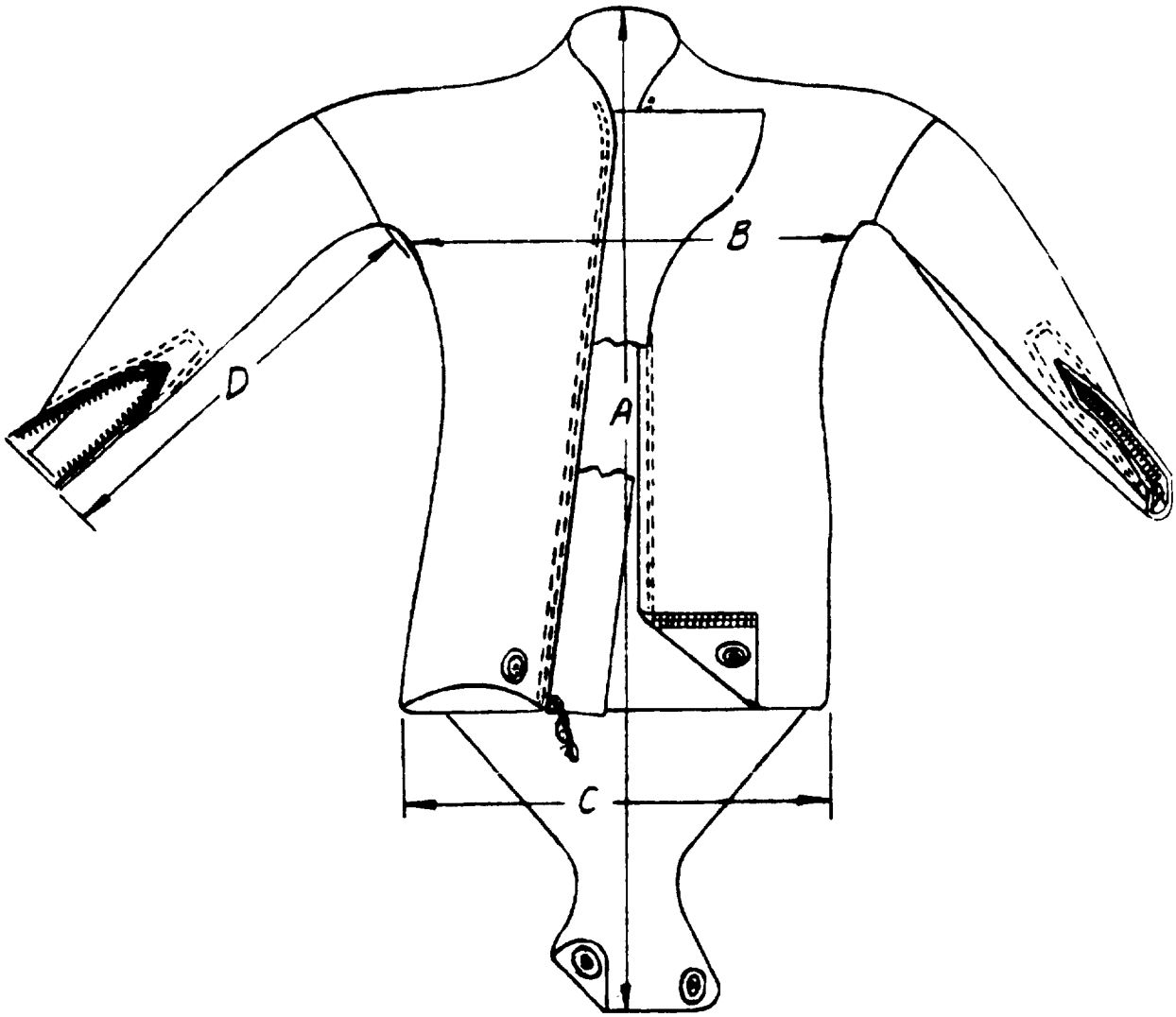

FIGURE 1 JACKET, WET-SUIT, (CHLOROPRENE FOAM)

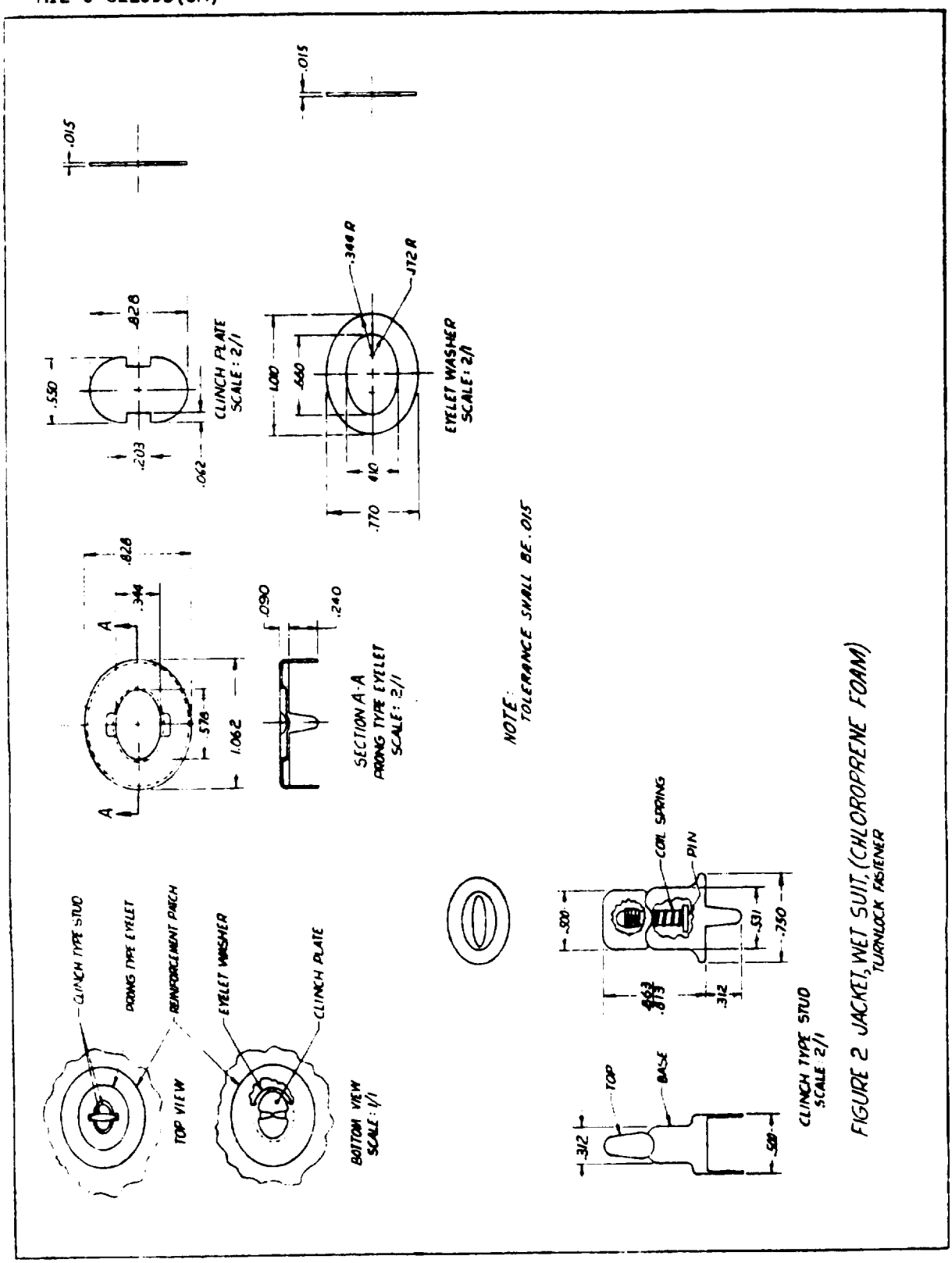

FIGURE 2 JACKET, WET SUIT, (CHLOROPRENE FOAM)
TURNLOCK FASTENER

FOLD

OFFICER IN CHARGE
NAVY CLOTHING AND TEXTILE RESEARCH UNIT
21 STRATHMORE ROAD
NATICK, MA 01760

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DoD 316

OFFICER IN CHARGE
NAVY CLOTHING & TEXTILE RESEARCH UNIT
21 STRATHMORE ROAD
NATICK, MA 01760

FOLD

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 in 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-J-82269A(SA) JACKET, WET SUIT (CHLOROPRENE FOAM)

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

DATE

DD FORM 1 JAN 72 1426

REPLACES EDITION OF 1 JAN 68 WHICH MAY BE USED

S/N 0102-014-1802