

INCH-POUND

MIL-DTL-32102

3 April 2002

DETAILED SPECIFICATION

**JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY (JSLIST)
COAT AND TROUSER, CHEMICAL PROTECTIVE**

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

1. SCOPE

1.1 Scope. This specification covers the requirements for chemical protective overgarment for military personnel.

1.2 Classification. (see 6.3).

Type I	Deleted
Type II.	Coat & Trousers, Overgarment, Chemical Protective, Non Flame Resistant
Type III	Deleted
Type IV	Deleted
Type V	Deleted
Type VI	Deleted
Type VII	Coat & Trousers, Overgarment, Special Operations Forces, Chemical Protective, Non-Flame Resistant

Class 1 - Woodland Camouflage Printed

Class 2 - Desert Camouflage Printed (3 Color)

1.3 Schedule of sizes. The chemical protective ensemble consists of a coat and trouser in the following sizes (see 6.3)

<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>X-Large</u>
X-Short	Short	Regular	Regular
Short	Regular	Long	
	Long		

Note: The sizes (Small, Medium, Large, and X-Large) may be abbreviated as S, M, L, and XL. The lengths (X-Short, Short, Regular, Long) may be abbreviated as XS, S, R, L.

Beneficial comments (recommendations, additions, deletions, clarifications) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP-CNR, 700 Robbins Ave., Philadelphia, PA 19111-5096 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-DTL-32102**2. APPLICABLE DOCUMENTS**

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

2.2 Government Documents

2.2.1 Specifications, standards, and handbooks The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS), and supplement thereto, cited in the solicitation (see 6.3)

SPECIFICATIONS**FEDERAL**

A-A-50199 Thread, Polyester Core, Cotton - Polyester Covered
 A-A-55126 Fastener Tapes, Hook and Loop, Synthetic
 A-A-55634 Zippers (Fasteners, Slide Interlocking)

DEPARTMENT OF DEFENSE

MIL-STD-810F Environmental Engineering Considerations and Laboratory Tests
 MIL-T-3530 Thread and Twine, Mildew Resistant or Water Repellent Treated
 MIL-PRF-5038 Tape, Textile, and Webbing, Textile, Reinforcing, Nylon
 MIL-W-5664 Webbing, Textile, Elastic
 MIL-F-10884 Fasteners, Snap
 MIL-DTL-32075 Label: For Clothing, Equipment and Tentage (General Use)
 MIL-C-43303 Cord, Elastic, Cotton
 MIL-T-43566 Tape, Textile, Cotton or Polyester, General Purpose

DEPARTMENT OF THE ARMY

DTC TOP 8-2-501 Permeation and Penetration Testing of Air-Permeable, Semipermeable, and Impermeable Materials With Chemical Agents or Simulants (Swatch Testing).
 DTC TOP 10-2-022 Man-In-Simulant (MIST) Test Operating Procedures
 DTC TOP Aerosol Testing of Chemical Protective Clothing
 DTC TOP 10-2-021 General Performance Tests of Combat Uniforms & Protective Equipment

[Applications for copies should be addressed to the Defense Technical Information Center, 8725 John J. Kingman Road, Ft. Belvoir, VA 22060-6218 or by accessing the following: Go to web page <http://www.dtc.army.mil>. Choose the PUBLICATIONS button, then the link to Index of International Test Operation Procedures (ITOP) and Test Operation Procedures (TOP). This goes to the Developmental Test Command (DTC) Pam 25-32, 16 Mar 98, where there is an index and instructions for obtaining copies of TOPs.]

NAVY CLOTHING & TEXTILE RESEARCH FACILITY

JSLIST TOP Heat Stress Testing of Protective Clothing Materials and Ensembles

[Applications for copies should be addressed to JSLIST Library, Battelle Memorial Institute, 24 Center Street, Suite 103, Stafford, VA 22554, 540-288-5500.]

MIL-DTL-32102**MILITARY HANDBOOKS**

FM 42-414 Tactics, Techniques, and Procedures for Quartermaster Field Service Company, Direct Support.

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Commander, US Army Combined Arms Support Command ATTN: ATCL-AQ, 401 1st Street Suite 227 Fort Lee, VA 23801-1511).

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

DISC DWG 02935 Fasteners, Snap Style 2A
DISC DWG 02936 Fasteners, Snap Style 2

(Copies of the above drawings are available from the Defense Supply Center Philadelphia, Attn: DSCP-CNR, 700 Robbins Avenue, Philadelphia, PA 19111-5094).

U.S. ARMY SOLDIER, BIOLOGICAL AND CHEMICAL COMMAND

2-1-1516 Woodland Camouflage Pattern (48 inches)
2-1-1516B Woodland Camouflage Pattern (60 inches)
2-1-2240 Desert Camouflage Pattern (48 & 60 inches)

(Copies of the camouflage pattern drawings are available from U.S. Army Soldier and Biological Chemical Command, Natick Soldier Systems Center, ATTN: AMSSB-RIP-TS(N), Natick, MA 01760)

2.3 Non-Government Publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.3).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 737 Standard Test Method for Air Permeability of Textile Fabrics
ASTM D 1424 Standard Test Method For Tear Resistance of Woven Fabrics by Falling Pendulum (Elmendorf) Apparatus
ASTM D 1683 Standard Test Method for Failure in Sewn Seams of Woven Fabrics
ASTM D 1776 Standard Practice for Conditioning Textiles for Testing
ASTM D 3776 Standard Test Methods for Mass Per Unit Area (Weight) for Woven Fabrics
ASTM D 6193 Standard Practice for Stitches and Seams

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19428-2959.)

NON-GOVERNMENT STANDARDS

International Standards Organization
ISO STANDARD 11092 Textiles-Physiological Effects-Measurement of Thermal and Water-Vapour Resistance under Steady-State Conditions (Sweating Guarded-Hotplate Test)

(Applications for copies should be addressed to the International Organization of Standardization, Case Postale 56, Geneva, Switzerland CH-1211.)

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Aerospace Industries Association

NASM 20652-1 Eyelet, Metallic, Rolled Flange Type and Washer

(Copies of this document may be purchased from the Aerospace Industries Association of America, 1250 Eye Street, NW, Suite 1200, Washington, DC 20005-3924, 202.371.8400, <http://www.aia.aerospace.org>)

AMERICAN SOCIETY FOR QUALITY

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes

(Applications for copies should be addressed to the American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202).

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. Requirements.

3.1 First article. When specified (see 6.4), the contractor shall furnish sample unit(s) of coats and trousers for first article inspection and approval (see 4.3, and 6.3)

3.2 Guide sample. Samples of coats and trousers, when furnished, are solely for the guidance and information to the contractor (see 6.5). Variations from the specification may appear in the sample in which case this specification shall govern.

3.3 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

PART I – Overgarment Performance

3.4 Performance qualification requirements. Performance Qualification Test (PQT) requirements are those requirements that any candidate must meet in order to be considered a qualified source for JSLIST garments. If a candidate material or technology requires a modification to the Government controlled configuration of the suit, then Operational Testing will also be required. The Marine Corps' JSLIST Program Office shall manage the performance qualification testing and assume monetary and fiduciary responsibilities for qualification.

Target performance values for PQT are given within the subparagraphs of paragraph 3.4. However, geographic areas, climatic conditions, individual garment use, and other variables will influence test results. Therefore, the Government will subject the current approved JSLIST garment to the same testing and evaluation parameters to provide an opportunity for side-by-side comparison. This side-by-side testing and evaluation will be conducted to determine whether any new candidates perform better than or equal to the current approved garment. The results of the side-by-side testing will weigh more heavily than meeting the target performance values in selecting a new garment for production.

3.4.1 Material toxicity. JSLIST overgarment materials shall be deemed to have no adverse health effects on humans when evaluated by the U.S. Army Center for Health Promotion and Preventative Medicine (CHPPM) for toxicity requirements. A Toxicity Clearance is required for all non-metallic components used in the overgarment.

3.4.2 Chemical agent protection.

3.4.2.1 Liquid/vapor challenge agents with field wear, launderings and battlefield contaminants. The JSLIST overgarment shall provide twenty-four hours of continuous protection from a liquid challenge of 10 g/m² of the chemical agents HD, GD and VX after a 45 day period of wear (720 cumulative hours) and six launderings,

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per Formula II, DA Field Manual 42-414; to include resistance after being contaminated with battlefield contaminants: sweat, Air Force Firefighting Foam (AFFF), DEET (N,N-diethyl-m-toluamide), seawater, diesel, body waste and Decontaminating Solution 2. The upper 95% confidence limit of the geometric mean permeation (mg-min/m^3) computed from the logarithmic analysis of the swatch data, shall be less than or equal to the following target performance values for chemical agents identified: GD, 357.29 CT (mg-min/m^3); HD, 671.24 CT (mg-min/m^3). For VX, the upper 95% confidence limit computed as the percent of swatches below Minimum Quantifiable Level (MQL), which is $5\mu\text{g}$ per sampling interval, shall be greater than or equal to 83% (or 10 out of 12) of samples below MQL. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.2.2 Fabric under stress. When stressed by the knees, elbows, or other body parts, the JSLIST overgarment shall provide twenty-four hours of continuous protection from a liquid agent challenge of 10g/m^2 of chemical agents GD and HD after a 45-day period of wear. Target performance value shall be no penetration. Side-by-side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target performance values.

3.4.2.3 Fabric under pressure. When pressure is applied to the JSLIST material system (for instance, when the externally contaminated garments are pressed against a surface) the JSLIST overgarment shall provide twenty-four hours of continuous protection from a liquid chemical challenge of 10g/m^2 of chemical agents GD and HD after a 45-day period of wear. Target performance value shall be no penetration. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.2.4 Effects of rainfall on chemical protection. When subjected to rainfall after 45-days of wear (720 cumulative hours), the JSLIST overgarment shall provide twenty-four hours of continuous protection from a liquid agent challenge of 10g/m^2 of chemical agents GD and HD. The target protection performance as specified in 3.4.2.1 from a liquid agent challenge of 10g/m^2 of chemical agents GD and HD shall not be degraded by more than 20%. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.2.5 Operating temperature. JSLIST shall provide twenty-four hours of continuous protection from a liquid agent challenge of 10g/m^2 of chemical agents GD and HD after exposure to extreme temperature ranges. Target performance values are as specified in paragraph 3.4.2.1. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.3 Integration.

3.4.3.1 Vapor protection. The JSLIST overgarment shall integrate with standard issue and co-developmental protective gloves, overboots, socks and masks to ensure no separations and provide whole-body protection to the individual from vapor exposure. For new or worn JSLIST overgarments, the vapor chemical agent simulant target performance values of the lower 95% confidence limit, computed from the logarithmic analysis of the data shall be equal to or greater than the following performance values: 1573 for the systemic CT (mg-min/m^3); and 2138 for the local CT. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.3.2 Aerosol and alpha/beta particle protection. The JSLIST overgarment shall integrate with the standard-issue and co-developmental chemical and biological protective gloves, overboots, socks and masks to ensure no separation and provide whole-body protection to the individual from aerosol exposure. The particle size within the aerosol test allows a limited evaluation of system alpha/beta radiation particle protection. Therefore, passing aerosol testing shall be equated with passing alpha/beta particle protection requirements. For new or worn JSLIST overgarments, the aerosol chemical agent simulant target performance values of the lower 95% confidence limit, computed from the logarithmic analysis of the data shall be equal to or greater than the following performance values: 3450 for the systemic CT (mg-min/m^3); and 10,000 for the local CT. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

MIL-DTL-32102**3.4.4 Durability.**

3.4.4.1 Wear time. The JSLIST overgarment shall withstand 45 days (720 cumulative hours) of wear and 6 launderings without degradation in chemical protection below the protection provided by the current approved JSLIST overgarment when subjected to the same field wear and laundering conditions. Target performance values are as specified in paragraph 3.4.2.1. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.4.2 Storage. Worn JSLIST overgarments, previously subjected to extreme storage temperatures, shall not have chemical protective characteristics that have degraded below the current approved overgarment when subjected to the same storage conditions. Target performance values for chemical penetration are as specified in paragraph 3.4.2.1. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.5 Heat stress.

3.4.5.1 Water vapor resistance. The water vapor resistance value of the JSLIST overgarment material system shall be better than or equal to the current approved JSLIST overgarment when tested under the same conditions. When tested with the Guarded Hot Plate, the target performance value of the water vapor resistance shall not exceed 9.6 m²Pa/W. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.5.2 Heat stress ratio. The JSLIST overgarment shall provide a heat stress ratio that is better than or equal to the current approved JSLIST overgarment when tested under the same conditions. When tested with the Thermal Manikin, the target performance value of the heat stress ratio vapor resistance shall be equal to or greater than 0.21 im/clo (minimum). Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.5.3 Thermal stress. The JSLIST overgarment shall not cause thermal stress levels sufficient to negatively affect human physiological or mission performance to any greater degree than the current approved JSLIST overgarment. Side-by side testing of the candidate material along with the current approved JSLIST overgarment material shall be conducted and comparative performance shall be more important than the target values.

3.4.6 Camouflage.**3.4.6.1 Color.**

Woodland. The class 1 cloth shall be printed in the 4-color Woodland Camouflage pattern (see 3.4.6.2) in the colors given in Table I. (See 2.2.2)

Desert. The class 2 cloth shall be printed in the 3-color Desert Camouflage pattern (see 3.4.6.2) in the colors given in Table II. (See 2.2.2)

3.4.6.2 Pattern execution. The pattern shall match the standard sample with respect to design, colors, and registration of the respective areas. Each pattern area shall show solid coverage; skitteriness exceeding that shown by the standard sample in any of the printed areas shall not be acceptable. The warpwise pattern repeat of the Woodland printed finished cloth shall be 27.25 +1.25 –2.25 inches. The warpwise pattern repeat of the Desert printed finished cloth shall be 16.75 +1.25 –2.25 inches. When the standard sample is not available for pattern execution, a pattern drawing shall be provided, and the pattern on the finished cloth shall match that of the drawing (see 2.2.2).

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3.4.6.3 Spectral reflectance. The spectral reflectance values for each color in the JSLIST outer shell materials shall conform to the requirements specified in Tables I and II.

TABLE I

Wavelength Nanometers (nm)	Woodland Camouflage Reflectance Values (percent)					
	Black 357		Light Green 354		Dark Green 355 and Brown 356	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
600	-	10	8	18	3	9
620	-	10	8	18	3	9
640	-	10	8	18	3	9
660	-	10	8	18	3	12
680	-	10	10	22	3	14
700	-	10	18	33	5	18
720	-	10	22	45	7	20
740	-	10	30	55	12	28
760	-	10	35	65	18	36
780	-	10	40	75	26	44
800	-	10	45	80	34	52
820	-	10	50	86	42	60
840	-	10	55	88	50	68
860	-	10	60	90	56	74

TABLE II

Wavelength Nanometers (nm)	Desert Camouflage Reflectance Values (percent)					
	Light Tan 492		Light Brown 493		Light Khaki 494	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
700	38	53	19	41	25	44
720	38	54	20	41	25	45
740	39	55	20	42	25	46
760	40	56	21	42	26	47
780	41	57	21	42	27	48
800	43	58	22	43	28	50
820	45	59	23	45	30	52
840	48	62	24	46	33	55
860	50	65	25	48	36	58

3.5 Production requirements

3.5.1 Material system requirements.

3.5.1.1 Liquid/vapor challenge agents when new/launched without wear. Each filter liner lot of completed JSLIST overgarments shall provide chemical agent protection levels equal to or better than the cumulative penetration results collected during qualification testing. If the geometric mean permeation of the FAT or PLT data is significantly greater than the geometric mean permeation of the pooled configuration cumulative penetration results at 1% significance level, i.e., the "p-value" is < 0.01, then the performance of the tested samples shall be considered to be significantly worse than previously tested samples and this shall constitute failure of the lot. In addition, each filter liner lot of completed JSLIST overgarments shall be retested every 60 months to ensure that chemical protection is not degraded throughout the 15-year shelf life.

3.5.1.2 Dimensional stability. The JSLIST overgarments shall not exceed an average shrinkage rate of 6.0% in either length or width when laundered six times in accordance with Appendix A. Garments laundered six times in accordance with Appendix A shall also not exhibit any critical defects listed in Table VIII.

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3.5.1.3 Fabric system weight. The fabric weight measurements of the JSLIST overgarment material system shall be consistent with the fabric weight values characterized during performance qualification testing of that material, i.e. shall not exceed 18.2 oz/yd² after bone drying.

3.5.1.4 Air permeability. The air permeability measurements of the JSLIST overgarment material system shall be consistent with the air permeability values characterized during performance qualification testing of that material system; i.e. the air permeability measurements of five samples of the current JSLIST overgarment material system shall average between 1.0 to 1.6 ft³ min/ft².

3.5.2 Outershell requirements.

3.5.2.1 Tear strength. The tear strength of the JSLIST outershell material shall be a minimum of 7.0 pounds warp strength and 5.0 pounds filling strength.

3.5.2.2 Fabric weight. The fabric weight measurements of the JSLIST overgarment outershell material shall be consistent with the fabric weight values characterized during performance qualification testing of the material, i.e. a minimum of 6.2 oz/yd² and a maximum of 7.2 oz/yd².

MIL-DTL-32102**PART II - Configuration**
Components and Design

3.6 Garment Components. This section applies to the current, approved JSLIST configuration, which consists of an outer shell and inner filter liner that is constructed so that it conforms to the requirements within this specification. Refer to 6.1 for a description of a material system that has successfully met all of the requirements listed in this document. If a candidate material or technology requires a modification to the Government controlled configuration of the suit, then Operational Testing will be required in addition to performance qualification testing.

Certificates of compliance shall be submitted to verify component performance and the Government reserves the right to inspect such items to determine the validity of the certification. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all component testing requirements. Except as otherwise specified in the contract or purchase order, the contractor 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 tests set forth in this section where such tests are deemed necessary to ensure supplies and services conform to prescribed requirements.

3.6.1 Thread. The cotton-covered or polyester covered, polyester core thread for stitching the coat and trousers shall conform to Type I or II of A-A-50199. The needle and looper/bobbin thread shall be 2-ply commercial size Tex 36 to 45 (ticket no. 50), with respective minimum breaking strengths of 3.2 and 3.7lbs., with a non-wicking, (WR) finish. As an alternate, the looper/bobbin thread shall be 2-ply commercial size Tex 31 to 35 (ticket no. 70), with respective minimum breaking strengths of 2.6 and 3.0 lbs., with a non-wicking (WR) finish. The thread may be dyed Camouflage Green 483 or Tan 380 as appropriate to the required garment class. As an option, the liner may be stitched with Black thread.

3.6.1.1 Water repellent treatment. The thread shall be water repellent treated with a Quarpel finish capable of conforming to MIL-T-3530 initial vertical rise wicking requirement. Lubrication of the Quarpel treated thread, by any means in the end item fabricator's plant prior to or during sewing, shall be prohibited. The yarn shall be non-staining and non-flame propagating.

3.6.2 Zipper

3.6.2.1 Coat zipper. All coat front closure zippers shall be separating individual element plastic tooth, size MS (5-7), with minimum crosswise breaking strength of 110 lb., or as an alternate, continuous element nylon or polyester (spiral type), size MS (5-7) with a minimum crosswise breaking strength of 175 lbs., conforming to the requirements of A-A-55634, Type IV, style 8, before being sewn into the garment. The zipper pulls shall have a hole with sufficient size to accommodate a 3/8 inch wide thong. Zipper slider shall be automatic lock with long tab pull (7/8 inch min.). The zipper tape shall be a minimum of 5/8 inch wide, polyester and water repellent treated. Zipper color for all components, including tape shall be Camouflage Green 483 or Tan 380 as appropriate to the required garment class. As an option, black may be used. The pin, box, and slider shall have a smooth engagement and operating action. In the case of the continuous element, the pin and box shall be metal. Size 5-7 black oxidized chain may be used in lieu of plastic coil.

The length of the zipper for the Type II coat shall be as follows:

SIZE	LENGTH (inches)
Small/X-Short	20-1/2
Small/Short	21-1/2
Medium/Short	22
Medium/Regular	23-1/2
Medium/Long	25
Large/Regular	24
Large/Long	25-1/2
X-Large/Regular	27-1/2

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The length of the zipper for the Type VII coat shall be as follows:

SIZE	LENGTH (inches)
Small/X-Short	20
Small/Short	21
Medium/Short	21-1/2
Medium/Regular	23
Medium/Long	24-1/2
Large/Regular	23-1/2
Large/Long	25
X-Large/Regular	27

3.6.2.2 Trouser zipper. All trouser fly front zippers shall be non-separating (closed bottom/open top) continuous element chain, size MS (5-7), with minimum crosswise breaking strength of 175 lbs., conforming to A-A-55634, Type I, style 3 or style 4 (cam only) before being sewn into the garment. Solid type closed-end bottom stops shall abut the end of the zipper chain, and be securely affixed to the zipper tape without damage to the tape or chain. The zipper pulls shall have a hole with sufficient size to accommodate a 3/8 inch wide thong. Zipper slider shall be automatic lock with short tab pull (below 7/8 inch). Zipper color for all components, including tape may be Camouflage Green 483 or Tan 380 as appropriate to the required garment class. As an option, black may be used. The zipper tape shall be a minimum of 5/8 inch wide, polyester and water repellent treated. Size 5-7 black oxidized chain may be used in lieu of plastic coil. Continuous chain roll application may be used in lieu of preassembled fasteners.

The length of the zipper for the trousers shall be as follows:

SIZE	LENGTH (inches)
Small/X-Short	9-1/2
Small/Short	10
Medium/Short	10-1/2
Medium/Regular	11
Medium/Long	11-1/2
Large/Regular	11-1/2
Large/Long	12
X-Large/Regular	13-1/2

3.6.3 Hook and loop fastener tape. The hook and loop fastener tape shall be 5/8 inch; 1 inch; and 1-1/2 inches wide unless otherwise specified. The tape shall conform to Type II, class 1 of A-A-55126. The color shall be Camouflage Green 483 or Tan 380 as appropriate to the required garment class. The loop fastener tape used on the Type VII sleeve pocket shall finish 5 inches wide by 3-1/2 inches long.

3.6.4 Snap fasteners. For interface purposes, snaps shall conform to MIL-F-10884 and with either Defense Industrial Supply Center (DISC) Drawing No. 02935 (Style 2A) or 02936 (Style 2). Snaps shall be black oxidized, be securely set between button/socket and stud/eyelet. All snaps shall provide a positive engagement with a smooth and even disengagement.

3.6.5 Eyelet. Eyelet shall conform to BE-114 of NASM 20652, Eyelet, Metallic, Rolled Flanged Type and Eyelet Washer. Eyelet washer shall conform to BBB-101 of NASM 20652, Eyelet, Metallic, Rolled Flange Type and Eyelet Washer. .

3.6.6 Cord lock. Neck cord lock shall be of tandem design such that the right side and left side shall operate independently of each other with spring load push button release mechanisms. Cord lock shall be capable of attaching both sides together with a minimum separation force of 13 pounds. However, a separate spring loaded button shall be available to quickly release sides. When totally assembled, the cord lock shall exhibit an 8 pound minimum holding force before slippage of the elastic cord occurs. The double barrel lock for the hood draw cord shall be 1/4 inch in diameter conforming to ITW Nexus Barreloc Part No. 309-0000 or equal (see 6.8 and 6.9).

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3.6.7 Elastic cord. The cotton elastic cord for the coat retention cord holder and hood cord shall be 3/16 inch in diameter conforming to class 2 of MIL-C-43303. The color shall be Camouflage Green 483 or Tan 380 as appropriate to the required garment class. The Colorfastness requirements shall not apply.

3.6.7.1 Elastic resin impregnation agent. The exposed ends of the elastic cord shall be treated for a minimum of least ½ inch with a cellulose acetate or cellulose acetate butylrate resin agent to prevent unraveling. As an alternate to dipping or impregnating the ends of the drawcords, an applied tip may be used. The tip shall be nylon or acetate sheet or film having a thickness of 0.013 to 0.016 inch. The color of the material for the tip shall be clear. The treatment shall not alter the color of the cord and shall not propagate a flame.

3.6.8 Nylon webbing. The nylon webbing for the coat retention cord holder shall be 1 inch wide, and the waist tab adjustment shall be 1-1/2 inches wide and shall conform to Type IV, class 1 or 1A of MIL-PRF-5038. The nylon webbing for the leg drawcord shall be 3/8 inch wide and shall conform to Type III, class I or IA of MIL-PRF-5038. The thickness for type IV widths shall be between .030-.040 inches. The color shall be either Camouflage Green 483 or Tan 380 as appropriate to the required garment class.

3.6.9 Elastic webbing. The elastic webbing used in the waist tab adjustments shall be 1-1/2 inches wide with a minimum thickness of .038 inch, and a minimum weight of 0.65 oz/linear yard conforming to Type II, Class 1 of MIL-W-5664. The color shall be either Camouflage Green 483 or Tan 380 as appropriate to the required garment class.

3.6.10 Cotton tape. The cotton tape used for the suspenders shall be one inch wide conforming to Type I, Class 8 of MIL-T-43566. The color shall be Camouflage Green 483 or Tan 380 as appropriate to the required garment class. Color fastness requirements shall not apply.

3.6.11 Fastener (slide release). The fastener (slide release) for the suspenders shall be black Acetyl Delrin plastic conforming to ITW Nexus Part No. 101-0100 or equal (see 6.8 and 6.9).

3.6.12 Slide (triglidge). The slide (triglidge) for the suspenders shall be black Acetyl Delrin plastic conforming to ITW Nexus Part No. 105-0100 or equal (see 6.8 and 6.9).

3.6.13 Reflective fabric. The reflective fabric used on the Type VII Special Operations Forces Overgarment sleeve pocket flap shall be 3M Scotchlite 9910 Industrial Wash Reflective Fabric 9910 Silver or equal (see 6.13).

3.6.14 Labels. Each coat and trouser shall have an identification, size, and instruction label in accordance with MIL-DTL-32075, Type VI, Class 14, or equal (see 6.8 and 6.15). The label shall be as follows:

OVERGARMENT, CHEMICAL PROTECTIVE, NFP (EXAMPLE)
 CONTRACT NO: SP0I00-97-X-XXXX (EXAMPLE)
 FIBER CONTENT:
 OUTERSHELL: 50% NYLON/50% COTTON (EXAMPLE)
 LINER: JSLIST APPROVED MATERIAL (EXAMPLE)
 NAME OF CONTRACTOR: ABC, INC. (EXAMPLE)
 SIZE: MEDIUM/REGULAR (EXAMPLE)
 STOCK NO: NSN 8415-00-000-0000 (EXAMPLE)
 SURVEILLANCE MARKING NO: AB 1/ - 000000 2/ - 000 3/ (EXAMPLE)

Note to manufacturers on Surveillance Marking:

- 1/ First two letters are the fabric manufacturer's company name, using capital letters.
- 2/ Date: A. First two numbers shall indicate day the fabric lot was fabricated.
 B. Middle two numbers shall indicate month the fabric lot was fabricated.
 C. Last two numbers shall indicate year the fabric lot was fabricated.
- 3/ The last three numbers shall indicate the number of the lot fabricated for the above indicated day.

CARE INSTRUCTIONS

CAUTION: Close zippers, hook and loop fasteners, etc. before laundering and turn garment inside out.

MIL-DTL-32102**DO NOT STARCH/CHLORINE BLEACH/DRY CLEAN/PRESS**
DO NOT REMOVE THIS LABEL

Laundry record:

Uniform may be washed up to 6 times. Cross off number in box with indelible marker after each laundering.

1	2	3	4	5	6
---	---	---	---	---	---

a. Field/post laundry: Launder using Formula II of FM 42-414. Tumble dry at temperature not to exceed 120⁰F (48⁰C). Remove immediately from the dryer.

b. Laundering in home laundry machine: Use permanent press wash cycle, warm water 90 -110 degrees F (32-43 degrees C) and a mild non-phosphate laundry detergent. Tumble dry at low temperature 110-120 degrees F (43-48 degrees C) and remove immediately from dryer.

Hand laundering: Hand wash using warm water and mild non-phosphate laundry detergent. To drip dry, remove from water and place on rust proof hanger.

c. Navy shipboard laundering: Follow Navy Wash Formula III. Tumble dry at low temperature 110-120⁰F. Remove immediately from dryer.

For Coat:

1. **CAUTION** Protection provided by the garment is completely degraded in the areas where the garment is wet through with fuel, oil, or hydraulic fluid.

2. **CAUTION** If the garment must be worn in water, (such as a river crossing) the zipper should be opened and the coat retention cord holder unfastened. This action will minimize accumulation of water between the suit and the body.

For Trouser:

1. **CAUTION** Protection provided by the garment is completely degraded in the areas where the garment is wet through with fuel, oil, or hydraulic fluid.

2. **CAUTION** If the garment must be worn in water, (such as a river crossing), the bottoms of the trouser legs should be opened. This action will minimize accumulation of water between the suit and the body.

3. In most circumstances conditions will permit you to remove your footwear prior to donning or doffing these trousers. However, in some conditions of chemical warfare it will be necessary to don and doff your trousers without removal of this footwear. In the event, care must be taken.

4. Inspect your leg closure system to ensure it is free from dirt and ice, and is firmly compressed to provide adequate closure.

3.6.14.1 Fit and size prediction legend. The markings shall be applied to the vapor barrier bag. The use of adhesive labels is prohibited. The label shall be as follows:

NATIONAL STOCK NUMBER: 8415-00-000-0000 (EXAMPLE) OVERGARMENT, COAT, CHEMICAL
PROTECTIVE: OUTERSHELL: 50% NYLON/50% COTTON
LINER: JSLIST APPROVED MATERIAL (EXAMPLE)
SIZE:MEDIUM/REGULAR (EXAMPLE)
CONTRACT NO: M67854-95-F-3106 (EXAMPLE)
DATE PACKAGED: (LEAVE BLANK) *
MANUFACTURE DATE: (LEAVE BLANK)
INSPECTION DATE: (LEAVE BLANK)
SURVEILLANCE MARKING NO: AB 1/ - 000000 2/ - 000 3/ (EXAMPLE)
W or D

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(1) When maximum protection is required, wear this suit with Chemical Protective Mask; Chemical Protective Gloves; and Chemical Protective Footwear.

(2) Use the size prediction charts to determine the suit size you will need

1/ First two letters are the fabric manufacturer's company name, using capital letters.

2/ Date

A. First two numbers shall indicate day the fabric lot was fabricated.

B. Middle two numbers shall indicate month the fabric lot was fabricated.

C. Last two numbers shall indicate year the fabric lot was fabricated.

3/ The last three numbers shall indicate the number of the lot fabricated for the above indicated day.

3.7 Design.

3.7.1 Coat. The coat shall be: hip length design with attached hood and adjustable elastic drawcord around the face opening (Types II) or attached collar (Type VII) . All types shall have an elastic drawcord at the hem; an elastic cord that is drawn between the legs at center back and secured in the coat retention cord holder at center front; raglan sleeves with bellow pocket and flap on left sleeve (Type II); or raglan sleeves with bellow pockets and flap on both sleeves (Type VII); wrist adjustment straps with hook and loop closures; and an interior elbow reinforcement and front zipper closure with flap (see Figures 1 and 3).

3.7.2 Trousers. The trousers shall be: high-rise waist design with suspenders; interior knee, pocket, and seat -reinforcement pieces; elasticized waist adjustment tabs; zipper front with single snap protective flap; two bellow type cargo pockets with flaps, with hook and loop flap fasteners; and leg tabs at lower leg with hook and loop fastener closures; and a leg drawcord at the bottom of each trouser leg (Type VII only) (see Figures 2 and 4).

3.8 Patterns. Standard patterns, which show size, directional lines, placement marks, and notches for assembly, except where otherwise specified, will be furnished by the Government. The government pattern shall not be altered in any way and shall be used to create the contractor's working patterns. Minor modifications are permitted to the contractor's working pattern where necessary when using automatic equipment or production processes. These modifications shall not alter the appearance, serviceability, or dimensional requirements cited in this document. Note: The seam allowance for patterns shall be as follows unless specified otherwise in the table of operations:

Type 607 stitched seam – 1/2 inch. The 1/2 inch dimension includes 1/4 inch for trimming, cut from top and bottom layers using the 607 machine. When 1/2 inch seam allowance on the working pattern is trimmed prior to assembly, it shall be trimmed to 1/4 inch and the 607 machine shall not cut an additional 1/4 inch from the seam allowance. In addition, the needle shall go through both layers of the seam in order to maintain seam integrity.

Shell seams – 1/2 inch

Join hood to body – 3/8 inch

Join coat to collar – 3/8 inch

Join lining hood to body – 1/4 inch

3.8.1 List of pattern parts. The component parts of the chemical protective overgarment shall be cut from the fabrics specified, in accordance with patterns parts indicated in Table V.

Table V - Pattern Parts

COAT - Type II

Outershell:	Cut Parts
Front	2
Back	1
Sleeve	2
Left hood	1
Right hood	1
Hood channel	1

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Left sleeve pocket	1
Left sleeve pocket flap	2
Sleeve tab	2
Left sleeve pocket reinforcement	1
Elbow patch reinforcement	2

Front lining	2
Back lining	1
Front sleeve lining	2
Back sleeve lining	2
Left hood lining	1
Right hood lining	1

Nylon Webbing:	
Coat retention cord holder	1

COAT –Type VII Cut Parts

Front	2
Back	1
Sleeve	2
Topcollar	1
Undercollar	1
Left sleeve pocket	1
Left sleeve pocket flap	2
Right sleeve pocket	1
Right sleeve pocket flap	2
Sleeve tab	2
Left sleeve pocket reinforcement	1
Right sleeve pocket reinforcement	1
Elbow patch reinforcement	2

Lining:	
Front lining	2
Back lining	1
Front sleeve lining	2
Back sleeve lining	2
Collar interlining	1

Nylon Webbing:	
Coat retention cord holder	1

TROUSER – All Types

Outershell:	Cut Parts
Leg front and back (Type II)	2
Leg front and back (Type VII)	2
Cargo pocket	2
Cargo pocket facing	2
Cargo pocket flap	4
Fly protective flap	1
Leg tab	4
Knee patch reinforcement	2
Cargo pocket reinforcement	2
Seat patch reinforcement	2

Lining:	
Front lining	2
Back lining	2

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Fly protective flap lining

1

3.9 Construction. For interface and serviceability purposes, the construction shall conform in all respects to the requirements specified in Table III and IV and herein. Figures are furnished solely for guidance and information. Should variation between the specification and the figure appear, the specification shall govern (See Figures 1-4).

3.9.1 Stitches, seams, and stitching. Stitches, seams, and stitching types specified in Tables III and IV shall conform to ASTM D 6193. Whenever two or more methods, seams, or stitches are given for the same part of an operation, any one of them may be used. Ends of all stitching, when not caught in other seams or stitching, shall be backstitched not less than 1/2 inch.

- a. Repairs of Types 607 shall be made with a Type 304 stitch.
- b. All hook and loop tape shall be 1/8 to 3/16 inch from edge.
- c. All topstitching shall be 1/4 inch from edge.
- d. Stitches per inch shall be 8 to 12.

3.9.2 Type 607 stitching. Type 607 (flat lock), a six thread (four needle, one looper, one cover) flat lock stitch. The seam shall be $3/16 \pm 1/16$ inch wide and lapped such that a minimum of one needle penetrates through both the top and bottom layer of lap to provide for an even seam without spacing between the overlapped fabric. All flatlock seams shall be constructed so that the raw edges overlap without spacing.

3.9.3 Bartacking. Bartacks shall be 3/8-1/2 inch long, and shall contain 28 stitches minimum. Bartacks shall be free from thread breaks and loose stitching.

3.9.4 Cutting and marking.

3.9.4.1 Cutting coat and trousers. Cut the coat and trousers in accordance with directional lines on patterns furnished. Cut the outershell fabric parts from one lot of fabric except sleeve tabs, sleeve pocket reinforcements, elbow patch reinforcements, fly protective flaps, leg tabs, cargo pocket facings, zipper thongs, suspender loops, cargo pocket reinforcement, seat patch reinforcements, and knee patch reinforcements which may be cut from ends. Cut all coat or trouser lining parts from one lot of fabric. Cut elastic cord for the hood opening 28 ± 1 inches in length for all sizes (treat ends to prevent unraveling). Cut the 3/8 inch wide nylon webbing for the leg drawcord 40 ± 1 inches in length for all sizes (treat ends to prevent unraveling). Cut the elastic cord for the coat retention cord at bottom of coat in the following lengths (treat ends to prevent unraveling).

COAT RETENTION CORD:

Cut the lengths of the elastic cord as follows:

SIZE	ELASTIC CORD LENGTH
Small/X-Short	56
Small/Short	56
Medium/Short	62
Medium//Regular	62
Medium/Long	62
Large/Regular	68
Large/Long	68
X-Large/Regular	73

SUSPENDERS:

Cut the lengths of 1 inch cotton tape for the suspenders as follows:

Front:

SIZE	COTTON TAPE LENGTH
All Sizes	4 inches (cut 2)

Rear:

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SIZE	COTTON TAPE LENGTH
Small/X-Short	52 (cut 2)
Small/Short	52 (cut 2)
Medium/Short	58 (cut 2)
Medium//Regular	58 (cut 2)
Medium/Long	58 (cut 2)
Large/Regular	58 (cut 2)
Large/Long	58 (cut 2)
X-Large/Regular	58 (cut 2)

3.9.4.2 Marking. All parts except those in paragraph 3.9.4.1, shall be cut from one lot of material. Lining parts shall have the surveillance number clearly identified. Only one surveillance number can be used in a coat or trouser.

The following marking methods shall be PROHIBITED:

- a. Metal fastening devices
- b. Sew-on type markings.
- c. Adhesive type tickets which discolor the fabric or leave traces of paper or adhesive upon removal of tickets.
- d. Punched or drilled holes

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
1.	<u>Seam direction.</u>		
	The direction of the joining seams shall be as follows:		
	a. Fronts over backs at sides and sleeve underarm.		
	b. Raglan sleeve seam over fronts and backs.		
2.	<u>Make left sleeve pocket flap.</u>		
	a. Stitch pocket flap, turn, and topstitch all sides.	301	LSbl-2
	b. Stitch loop fastener tape to flap according to pattern marks.	301	LSbj-1
	Note: For Type VII, the sleeve pocket flap shall be placed on both sleeves.		
3.	<u>Make sleeve pocket.</u>		
	a. Stitch sewn eyelet in pocket according to pattern marks	401 or 502 or 503	Eyelet
	b. Turn top edge of pocket inside, as indicated on pattern, and with the raw edge turned in, single stitch 1/16 to 1/8 inch from edge.	301	Efb-1
	c. Stitch hook fastener tape to pocket according to pattern marks.	301	LSbj-1
	d. Stitch the cut out corner of the pocket with a 3/8 inch seam forming the bellows.	301	LSq-2
	e. As indicated on pattern, fold both the side and bottom with the wrong sides together and raise stitch 1/8 to 3/16 inch from edges. Fold face to face to form the bellows on the side and bottom and raise stitch 1/8 to 3/16 inch along side and bottom. Sleeve pocket shall finish 5/-1/2±1/4 inches wide at top of opening and 7±1/4 inches deep.	301	OSf- 1
	f. TYPE VII ONLY. Stitch the loop fastener tape to the pocket according to pattern marks.	301	LSbj-1
	g. TYPE VII ONLY. Stitch the reflective tape to the pocket according to pattern marks.	301	LSbj-1
	Note: For Type VII, the sleeve pocket shall be placed on both sleeves.		
4.	<u>Attach elbow patch reinforcement to sleeve.</u>		
	a. Position elbow patch reinforcement on wrong side of sleeve outershell according to marks on pattern. The printed side of the	301	LSbj-1

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
	elbow patch shall face the wrong side of the outershell. Stitch around all sides 1/8-3/16 inch from all edges.		
5.	<u>Attach sleeve pocket, sleeve pocket flap, and sleeve pocket reinforcement.</u>		
	a. Position sleeve pocket and sleeve pocket flap to sleeve according to pattern marks. The bellows side of the pocket shall finish towards the back. Place sleeve pocket reinforcement piece to sleeve 1 inch beyond marks on all sides; printed side of reinforcement material to wrong side of sleeve.		
	Note: The sleeve pocket and sleeve pocket flap shall be stitched to the reinforcement piece within the same operations.		
	b. Turn in the seam allowance on the bellows side of pocket. Stitch bellows side of pocket to sleeve, through outershell and pocket reinforcement, positioned according to pattern marks, with one row of stitching 1/8 inch from edge. The end of the seam shall catch the turned-under allowance at bottom of pocket, closing bellows at bottom.	30I	LSd-1
	c. Turn in other side and remaining bottom seam allowance of pocket and stitch to sleeve through outershell and pocket reinforcement with one row of stitching 1/8 inch from edge to bellows side.	301	LSd-1
	NOTE: Operations 5b and 5c may be performed in one operation.		
	d. Bartack back and front edges at top of pocket opening with vertical bartacks in line with pocket stitching through pocket and coat.		
	e. Position raw edges of sleeve pocket flap above pocket opening, according to pattern marks, and stitch through outershell and sleeve pocket reinforcement, 3/16 to 1/4 inch from raw edges. Turn flap down and raise stitch 1/4 to 5/16 inch from turned edge, burying the raw edges within the seam	301	LSbl-2
	or		
	f. Turn in top raw edge of flap, positioned on coat according to pattern marks, and double-stitch through outershell and sleeve pocket reinforcement burying raw edges within seam.	301	LSd-2
	g. Superimpose a horizontal bartack at each end of the topstitching attaching the pocket flap to the coat.		
6.	<u>Make sleeve tabs.</u>		
	a. Stitch tabs, turn, and topstitch.	301	LSbl-2
	b. Attach hook fastener tape to tab according to pattern marks. Stitch around all sides.	301	LSbj-1

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
7.	<u>Join outershell sleeves.</u>		
	a. Stitch loop fastener tape to sleeves according to pattern marks.	301	LSbj-1
	b. Position the raw edge of the sleeve tab even with the raw edge of the sleeve according to pattern marks, taking care to keep the hook and loop in alignment. Stitch 1/8 to 3/16 inch from edge. Tabs must lie parallel to sleeve hem.	301 or 401	SSa-1
	c. Join sleeve to front and back.	301 or 401	LSc-2
	d. Join side and underarm seams, simultaneously catching the raw edges of elbow patch and sleeve tabs.	301 or 401	LSc-2
	e. Superimpose two vertical bartacks on each sleeve tab, on the inside row of doublestitching.		
8.	<u>Labels.</u>		
	a. Sew label on all four sides to the face side of the lining only on the inside right coat lining front, and centered between front and back seams, with bottom edges 1-3/4±1/4 inches from bottom edge of front. The stitching shall not be through the printing on the label nor through the outershell.	301	LSbj-1
9.	<u>Make Lining.</u>		
	a. Join sleeve outseam.	607	Lsa-4
	b. Join sleeve and underarm seams	607	LSa-4
	c. Close hood seams.	607	LSa-4
	d. Attach hood to body.	607	LSa-4
	Note: Stitch all seams with raw edges overlapped without spacing.		
10.	<u>Close outershell hood seams.</u>		
	a. Close hood seam, 1/2 inch seam allowance. Turn seam allowance to the back (under) and topstitch through all plies, 1/4 inch from finished edge.	301	LSq-2
11.	<u>Attach fastener tape to center front.</u>		
	a. Stitch hook fastener tape to right coat front according to pattern marks. Stitch around all four sides.	301	LSbj-1
12.	<u>Attach outershell hood.</u>		

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
	a. Attach hood to body.	301	SSa-1
	b. Attach 1 inch hook fastener tape and 1/2 inch or 5/8 inch hook fastener tape to right side of hood according to pattern marks.	301	LSbj-1
13.	<u>Close center front.</u>		
	a. Attach metal eyelets and washers and 2-inch by 2-inch outershell reinforcement pieces according to pattern marks.		
	b. Place lining on shell at center front, right sides together, matching raw edges and turning up hem corner according to pattern marks. Stitch 3/8 inch from front edge.	301	SSae-2(a)
	c. Turn coat to finished position and topstitch right and left edge.	301	SSae-2(b)
	d. Place outershell and lining wrong sides together matching neckline to neckline, with seam allowance facing up. Shell and lining seams are staggered.	301	SSa-1
	e. Attach loop fastener tape 1/4 inch from left finished edge from neck seam to finished bottom.	301	LSbj-1
	f. Attach 1 inch wide loop fastener tape to lining side of left hood front, 1/4 inch from finished edge of coat. It shall align with hook fastener tape on right front.	301	LSbj-1
14.	<u>Attach zipper.</u>		
	a. Position left side of zipper scoops to underside of left coat front 1-1/2 inches from finished edge. Doublestitch zipper in place, 1/16 inch from edge of tape, 1/8 inch stitch gage. Center a vertical bartack at the top and bottom of the zipper. Left zipper must match right zipper.	301	SSaa-2* Refers to double stitching
	b. Align right zipper with right side of hook fastener tape. Doublestitch zipper in place, 1/16 inch from edge of tape 1/8 inch stitch gage. Center a vertical bartack at the top and bottom of the zipper. Right zipper must match left zipper.	301	SSaa-2* Refers to double stitching
15.	<u>Close hood.</u>		
	a. Match raw edges of hood wrong sides together and staystitch 1/8 inch from raw edge.	301	SSa-1
	b. Stitch sewn eyelet in hood channel according to pattern mark.	401 or 502 or 503	Eyelet
	c. Overedge long side of hood channel furthest from sewn eyelet mark.	502 or 503 or	EFd-I

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
		509	
	d. Align unfinished edge of hood channel with raw edge of hood opening, right side of hood channel to right side of hood opening. Stitch 3/8 inch from raw edge, with ends of channel folded to the inside at least 3/4 inch. Turn channel and pull corners to finished position. Sewn eyelet shall finish 4-1/2±1/4 inches from right finished edge of channel.	301	BSp-2(a)
	e. With hood channel folded back onto itself, and sandwiching, the elastic within the fold, topstitch 1/16 inch from seam on channel itself. Hood channel shall finish 5/8 inch wide.	301	BSp-2(b)
	f. Superimpose a vertical bartack at the top of hood through joining seam and midpoint of elastic cord.		
	g. Insert ends of hood cord through double barrel cord lock and knot. The cord lock separation button shall face away from the wearer as worn.		
16.	<u>Make collar. (Type VII Coat Only).</u>		
	a. Stitch hook fastener tape to undercollar as indicated on pattern.	301	LSbj-1
	b. Position inner collar lining piece to top collar so that the face side of the lining faces the inside of the topcollar. With the outside edge of the collar lining placed 3/8 inch behind outside edge of the topcollar, stitch along edge of the lining 1/16 inch from edge.	301	LSbj-1
	c. Position topcollar face to face to shell lining with neck edges even. Stitch plies along front neckline with stitching continued along entire neckline.	301	SSe-2(a)
	d. Position undercollar to outershell face to face with neck edges even. Stitch undercollar to shell along front neckline with stitching continued along entire neckline.	301	SSe-2(a)
	e. Position lining to outershell face to face with fronts and collar edges even, join plies along front edge with stitching continued along entire collar edge.	301	SSe-2(a)
	Note: It is suggested to stitch with the shell lining on top.		
	f. Turn coat right side out and work out edges. Matching neckline to neckline with neckline seam allowances turned down, superimpose a line of stitching through all layers, overlapping previous line of stitching. Stitching shall start approximately 3 inches from center front and stop approximately 3 inches from center back, tacking the lining to the collar seam allowances. Shell and lining seams shall be staggered.	301	SSa-1

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TABLE III - CONSTRUCTION OF COAT

NO	OPERATION	STCH TYPE	SEAM TYPE
	g. Edge stitch fronts 1/4 to 5/16 inch from front edges with stitching continued across the entire collar edge 1/4 to 5/16 inch from collar edge.	301	SSe-2(b)
	h. Stitch loop fastener tape to topcollar so as to mate with hook fastener tape of undercollar. The stitching shall be $1/8 \pm 1/16$ inch from all edges. Hook and loop fastener tape shall finish 3/16 inch from the top finished edge of the collar.	301	LSbj-1
17.	<u>Hem coat bottom and sleeve bottom.</u>		
	a. Pull drawcord through metal eyelets, knotting the exposed ends of the coat retention cord.		
	b. Fold under raw edge of coat hem 1/4 inch and fold again according to notches forming a 1-1/4 ($\pm 1/8$) inch hem; ensuring the drawcord is folded within the hem. Edge stitch 1/16 inch from top folded edge. Shell and lining seams will be staggered 1/4 inch.	301	EFb- 1
	c. Fold under raw edge of sleeve hem 1/4 inch and fold again according to notches forming a 1 ($\pm 1/8$) inch hem. Edge stitch 1/16 inch from top folded edge. Shell and lining seams will be staggered 1/4 inch.	301	EFb- 1
18.	<u>Make and attach coat retention cord holder.</u>		
	a. Fold raw end of holder under according to pattern marks. Stitch 1/8 inch from folded edges, forming pull tab.	301	EFb- 1
	b. Fold heat sealed edge up in opposite direction according to pattern marks. Stitch 1/8 inch from folded edge.	301	EFb-1
	c. Position single folded end of holder to bottom of left coat front according to pattern mark with raw edge of tape facing coat. Attach holder to coat with male portion of snap fastener, with snap fastener positioned according to pattern mark.		
	d. Attach female portion of snap fastener to opposite end of holder according to pattern mark.		
19.	<u>Make and attach thong to zipper pull on coat.</u>		
	a. Make thong to finish 3/8-1/2 inch wide by 6 inches long.	406 or 301	EFh-I or EFp-2
	b. Thread one end of thong through end of zipper pull tab. With ends even, bartack within 1/2 inch from zipper pull tab.		

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
1.	<u>Make Fly Protective flap.</u>		
	a. Stitch fly protective flap shell and lining together face to face along curved edge with 3/8 inch seam allowance, turn and topstitch.	301	SSe-2
	b. Turn and turn again top edge of outershell even with the raw edge of lining and topstitch 1/16 inch from folded edge. Topstitching curved edge 1/4 inch from turned edge. The hem shall finish 1/2 to 5/8 inch in width.	301	SSI-2
2.	<u>Make pocket flap.</u>		
	a. Stitch pocket flaps, turn, and topstitch, 1/4 inch seam allowance.	301	LSbl-2
	b. Stitch loop fastener tape to flap according to pattern marks.	301	LSbj-1
3.	<u>Make cargo pockets.</u>		
	a. Stitch sewn eyelet in pocket according to pattern marks.	401or 502 or 503	Eyelet
	b. Fold pleats according to pattern marks, and stitch along the fold, $1/8 \pm 1/16$ inch from edge.	301	Osf-1
	c. Turn top edge of pocket inside, according to pattern marks, and with the raw edge turned in, single stitch 1/16 to 1/8 inch from edge.	301	EFb-1
	Note: Pleats shall fold toward the back of pocket as indicated on pattern.		
	d. Stay stitch across top and bottom of pleats to hold in position.	301 or 101 or 401	SSa-1
	e. With top raw edges of cargo pocket facing and cargo pocket turned under, stitch facing to top inside of pocket, 1/16 to 1/8 inch from edge.	301 or 401	SSc-1
	Note: This operation may be performed with automatic folders using facing cut off rolls. No more than one splice per facing.		
	or		
	f. Stitch the cargo pocket facing to the top of cargo pocket 1/4 inch from raw edge. Turn and edge stitch 1/16 to 1/8 inch from top edge.	301	SSe-2
	g. After either of the operations, turn in bottom raw edge of cargo pocket facing and stitch to cargo pocket $1/8 \pm 1/16$ inch from the folded edge.	301	LSk-2
	h. Stitch hook fastener tape lengthwise across the top finished	301	LSbj-1

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
	edge of the cargo pocket according to pattern marks, so that the tape finishes between the pocket bellows after pocket construction.		
	i. Bartack horizontally across fold of pleats. The bartacks shall not be more than 1/8 inch from the lower row of stitching.		
	j. Fold outside edge of bellows and stitch along folded edge (through facing 1/16 to 1/8 inch from folded edge). Place a vertical bartack 1/8 \pm 1/16 inch from top of pocket with the bartack superimposed on stitching.	301	Osf-1
	k. Fold bellows pleat at bottom of pocket; fold back side seam allowance in line with folded edge of pleat. Stitch across bottom of pleat catching side seam allowance in the stitching.	301	LSd-1
4.	<u>Make and attach leg closure tabs.</u>		
	a. Stitch tabs, turn, and topstitch.	301	LSbl-2
	b. Attach hook fastener tape to tab according to pattern marks.	301	LSbj-1
	c. Position leg closure tabs according to pattern marks. Stitch turn and topstitch. The finished leg tabs shall measure 1-1/2 inches wide by 7-3/4 \pm 1/4 inches long.	301	LSbl-2
	d. Superimpose two vertical bartacks on ends of topstitching attaching leg tab to trouser.		
	e. Stitch loop fastener tape to legs according to pattern marks. The hook and loop tape shall be kept in alignment.	301	LSbj-1
5.	<u>Attach knee patch reinforcement and seat patch reinforcement.</u>		
	a. The knee patch reinforcement shall be positioned on the wrong side of front outer shell according to marks on pattern. The printed side of the knee patch reinforcement shall face the wrong side of outershell. Stitch 1/8-3/16 inch in from all edges.	301	LSbj-1
	b. Position seat patch reinforcements on right and left backs according to marks on pattern with straight raw edges even with raw edges of inseam and seat seam. The printed side of the seat patch reinforcements shall face the wrong side of outershell. Stitch 1/8 – 3/16 inch from all edges.	301	LSbj-1
6.	<u>Attach cargo pocket and flaps to outershell.</u>		
	a. Place cargo pockets and cargo pocket flaps according to marks on pattern. The bellows side of the cargo pocket shall finish towards the back. Place cargo pocket reinforcement to trouser 1 inch beyond marks on all sides, printed side of reinforcement material to wrong side of trouser.		

Note: The cargo pocket and cargo pocket flap shall be stitched to the reinforcement piece within the same operations.

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
	b. Turn in the seam allowance on the bellows side of the pocket. Stitch bellows side of pocket to trousers, positioned according to pattern marks, with one row of stitching 1/16 to 1/8 inch from edge. The end of the seam shall catch the turned-under seam allowance at bottom of pocket, closing bellows at bottom.	301	LSd-1
	c. Turn in other side and remaining bottom seam allowance of pocket and stitch to trousers with one row of stitching 1/16 to 1/8 inch from edge to bellows side.	301	LSd-1
	Note: Operations 7b and 7c may be performed in one operation to attach the cargo pocket.		
	d. Bartack back and front edges of pocket opening with vertical bartacks in line with pocket stitching through pocket and trousers.	301	LSbl-2
	e. Position raw edges of cargo pocket flap above pocket opening according to pattern marks, and stitch through outershell and cargo pocket reinforcement, 3/16 to 1/4 inch from raw edges. Turn flap down and raise stitch 1/4 to 5/16 inch from turned edge, burying the raw edges within the seam.	301	LSd-2
	or		
	f. Turn in top raw edge of flap, positioned according to pattern marks, and doublestitch through outershell and cargo pocket reinforcement, burying raw edges within the seam.	301	LSd-2
	g. Superimpose a horizontal bartack at the ends of the topstitching attaching the pocket flap to the trouser.		
	Note: Ensure that the top of the pocket reinforcement is caught in the stitching attaching the pocket flap to the trousers.		
7.	<u>Make waist tab adjustments.</u>		
	a. Cut nylon webbing according to pattern.		
	b. Fold end of nylon webbing over according to template, position and stitch length of hook fastener tape according to template marks.	301	LSbj-1
	c. Insert 1-1/2 inch wide elastic webbing between edges of tape and box-X stitch in place according to pattern.	301	Box-X
	d. Topstitch around nylon webbing portion of waist tab adjustment 1/8 \pm 1/16 inch from edge.	301	LSbj-1
8.	<u>Attach waist tab adjustments.</u>		
	a. Stitch waist adjustment loop fastener tape to trouser according to pattern marks.	301	LSbj-1
	b. Box-X stitch end of waist tab adjustment according to	301	Box-X

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
	pattern marks.		
	c. Superimpose two vertical bartacks on waist tab adjustment on inside edge of boxstitching.		
9.	<u>Join outershell crotch, seat, and inseams.</u>		
	a. Position left front to right front at crotch and join the crotch seam beginning at the inseam and continuing for $2-7/8 \pm 1/8$ inches, stopping at notch as indicated on pattern. The seam allowance will be folded to left side. The top ply shall be turned sharply back over the first row of stitching. Two rows of stitching shall be placed at $1/8$ and $1/4$ inches from crotch seam on side of the seam allowance. Left fly shall overlap right side $1/8$ to $1/4$ inch at base.	301	LSq-3
	b. Join seat seam.	301 or 401	LSc-2
	c. Join inseams, with front lapped over back.	301 or 401	LSc-2
10.	<u>Join lining crotch, seat, outseams, and inseams.</u>		
	a. Join crotch seam to notch, seat seam, outseams, and inseams of trouser lining. Stitch all seams with raw edges overlapped without spacing.	601	Lsa-4
11.	<u>Join outershell and lining to front opening.</u>		
	a. Insert lining into the outershell. Turn raw edges under $3/8$ inch on left outershell and lining between plies at front opening and topstitch $1/16$ to $1/8$ inch from folded edge. Turn raw edges under $3/8$ inch at waistline to $1/4$ inch at base of fly opening on right outershell between plies and topstitch $1/16$ to $1/8$ inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.	301	SSc-1
12.	<u>Attach zipper to fly opening.</u>		
	a. Position zipper to inside of right front with back edge of chain extending beyond front edge $1/8 \pm 1/16$ inch. Stitch to front with two rows of stitching. The first row shall be $1/16$ to $1/8$ inch from back edge of tape and the second row $1/8$ to $3/16$ inch from first row. The top stop shall finish $1 \pm 1/8$ inch from top edge of finished waist. When zipper is placed on front the stitching shall continue to top end of fastener tape and be caught in stitching of waist hem. The stitching shall continue to the bottom end of the zipper tape.	301	SSbd-2
	a. Position zipper to inside of left front with edge of opened chain positioned as indicated on pattern. Stitch through tape to front of trousers with two rows of stitching. The first row shall be $1/16$ to $1/8$ inch from back edge of tape and the second	301	LSbj-2

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
	row 1/8 to 3/16 inch from the first row. The top end of tape will be caught in stitching of waist hem. The top stop shall finish $1 \pm 1/8$ inches from top edge of finished waist. The stitching shall continue to the bottom end of the zipper tape.		
13.	<u>Attach label.</u>		
	a. Sew label on all four sides to the face side of the lining only on the left back of the trouser lining with the top edges of label $3\text{-}1/8 \pm 1/8$ inches below top edge of liner. The stitching shall not be through the printing on the label, nor through the outershell.	301	LSbj-1
14.	<u>Finish waist.</u>		
	a. Turn top edge of outershell as indicated on pattern (even with lining fabric), and stitch 1/16 to 1/8 inch from turned edge, catching ends of the zipper tapes. The finished waist hem shall measure $3/4 \pm 1/8$ inch.	301	SSI-1
15.	<u>Attach fly protective flap.</u>		
	a. Position protective flap on inside left front, as indicated on pattern, with outershell toward the outside. Join to trousers stitching 3/16 to 1/4 inch from back and bottom edge of flap, forming J-stitching. The fly protective flap shall be horizontally bartacked at crotch over J-stitching. Bartack will extend past crotch seam 1/8 inch.	301	LSbj-1
	b. Place a vertical bartack even with the hemmed edge of fly protective flap and 1/4 to 5/16 inch from the back of the flap, and over J-stitching.		
16.	<u>Finish leg bottom (Type II).</u>		
	a. Hem trousers according to pattern marks. Stitch 1/16 to 1/8 inch from turned edge, around entire hem. Finished hem shall measure $5/8 \pm 1/8$ inch.	301	SSI-1
	Note: Liner must be caught in hem.		
17.	<u>Finish leg bottom (Type VII).</u>		
	a. Stitch sewn eyelets according to pattern marks at leg bottom.	401 or 502 or 503	Eyelet
	b. Pull leg tie through eyelets knotting the exposed ends of the leg tie. Ensure that the right end goes through the left sewn eyelet and the left end goes through the right sewn eyelet.		
	c. Fold under raw edge of trouser hem 1/4 inch and fold again according notches forming a $1 \pm 1/8$ inch hem; ensuring the leg tie is folded within hem.	301	SS1-1

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
	Edge stitch 1/16 inch from top folded edge. Shell and lining seams will be staggered 1/4 inch.		
	d. On opposite side of leg hem, place a vertical bartack perpendicular to the hem, through all plies, ensuring leg tie is caught in bartack.		
	Note: Liner must be caught in hem.		
18.	<u>Make and attach suspenders.</u>		
	a. Thread front suspender through female portion of side release buckle. Align ends of strap and center a bartack 5/8 inch from folded end.		
	b. Stitch 3 bartacks in a triangular shape joining the rear suspenders 12 ± 1 inches from the ends. The short ends of the suspenders shall lay approximately 4-1/2 inches apart when laid flat and straight.		
	c. Place a 3/4 inch square boxtack centered over the three bartacks. All stitching should engage both plies of material. The boxtack should appear as a diamond shape enclosing the three bartacks.	301	Ssa-1
	d. Thread long end of rear suspender through slide adjustment buckle, into male portion of side release buckle and back around bottom center of slide adjustment buckle. The raw end of the strap shall finish between the two straps. Center a 1/2 inch bartack approximately 1 inch from the slide adjustment buckle joining the end of the strap to the lower strap. Approximately 1 to 2 inches of the end of the strap shall extend below the bartack.		
	e. Join suspender with female portion of buckle to inside front of trouser according to pattern marks with a 3/4 inch boxtack 1/8 inch from sides of strap, 3/8 inch from end of strap, and 1/8 inch from top of waist. All stitching shall be $\pm 1/16$ inch. Center a horizontal bartack within the boxtack.	301	LSbe-2(b)
	f. Position the end of the male suspender strap tape to the inside of the trouser according to the pattern marks. The tape should extend approximately 1-1/4 inches down from the top edge of the hem. Fold the tape over the top of the hem and down the back of the trouser 1 inch and then fold the tape back onto itself. Sew a 3/4 inch boxtack thru all plies 1/8 inch from edges of tape. Sew bartack in the center of the boxtack.	301	LSbe-2(b)
	Note: Turned end may be basted before attaching.		
19.	<u>Make and attach thong to zipper pull on trouser.</u>		
	a. Make thong, to finish 3/8-1/2 inch wide by 6 inches long.	406 or 301	EFh-1 or EFfp-2
	b. Thread end of thong through end of zipper pull tab. With ends even, bartack within 1/2 inch from zipper pull tab.		

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TABLE IV - CONSTRUCTION OF TROUSERS

NO	OPERATION	STCH TYPE	SEAM TYPE
20.	<u>Attach snap fastener.</u>		
	<p>a. Secure a double stud snap fastener to right front at waist, according to marks on pattern. As an alternate, secure style 2 or 2A stud metal eyelet combination (on right outside of waist opening) and socket (on right side of waist opening) according to marks on pattern.</p> <p>b. Secure a female portion of snap fastener to left front at waist, positioned to correspond with male at right front at waist.</p> <p>c. Secure a socket or as an alternate a stud (if alternate 20a is used) portion of snap fastener to fly protective flap, positioned to correspond with the double stud fastener on the right front. The fly protective flap shall lay smooth and flat when the socket and stud are engaged.</p>		

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3.10 Finished measurements. The finished measurements shall be as shown in Tables V thru VI.

TABLE V. Chemical Protective Overgarment Coat (inches)

MEASUREMENT	S/XS	S/S	M/S	M/R	M/L	L/R	L/L	XL/R	Tolerance
Chest <u>1/</u>	46	46	52	52	52	58	58	64	± 1
Sweep <u>2/</u>	45-1/2	45-1/2	51-1/2	51-1/2	51-1/2	57-1/2	57-1/2	63-1/2	± 1
Back Length <u>3/</u>	24	25	25-1/2	27	28-1/2	27-1/2	29	28	± 1/2
Sleeve Outseam <u>4/</u>	31	31-1/2	32	33	34	33	34	33	± 1/2
Sleeve Inseam <u>5/</u>	21-1/2	22	22	23	24	23	24	23	± 1/4
Sleeve Bottom <u>6/</u>	13-1/2	13-1/2	14-1/2	14-1/2	14-1/2	15-1/2	15-1/2	16-1/2	± 1/2
Sleeve Underarm Width <u>7/</u>	21	21	24	24	24	27	27	30	± 1/2
Hood Height <u>8/</u>	14	14	14	14	14	14	14	14	± 1/4
Hood Width <u>9/</u>	10-1/2	10-1/2	10-1/2	10-1/2	10-1/2	10-1/2	10-1/2	10-1/2	± 1/4
Center Front Hood Height <u>10/</u>	6-3/4	6-3/4	6-3/4	6-3/4	6-3/4	6-3/4	6-3/4	6-3/4	± 1/4
Collar Height <u>11/</u>	3-3/8	3-3/8	3-3/8	3-3/8	3-3/8	3-3/8	3-3/8	3-3/8	± 1/4
Collar Length <u>12/</u>	23	23	24-1/2	24-1/2	24-1/2	26	26	27-1/2	± 1/4
Collar End <u>13/</u>	1-7/8	1-7/8	1-7/8	1-7/8	1-7/8	1-7/8	1-7/8	1-7/8	± 1/4

1/ Twice the measurement taken across front from folded edge to folded edge at base of armhole.

2/ Twice the measurement taken along bottom edge of coat from folded edge to folded edge.

3/ Measurement taken from seam at center back to bottom of coat along center back.

4/ Measurement taken along folded edge opposite underarm seam of sleeve from neckline seam to bottom edge of sleeve.

5/ Measurement taken along underarm seam from base of armhole to bottom edge of sleeve.

6/ Twice the measurement taken along bottom of sleeve from folded edge to folded edge.

7/ Twice the measurement taken from the underarm seam to a point perpendicular to the folded edge.

8/ Measurement taken from the neckline seam at the top of the front raglan seam to the top of hood. This measurement applies to Type II only.

9/ Measurement taken across hood from center back to the folded channel, at a point 3 inches down from the top of the hood opening. This measurement applies to Type II only.

10/ Measurement taken along center front edge of hood from neckline seam to the top fold of hood channel. This measurement applies to Type II only.

11/ Measurement taken from center back neck seam to top of collar. This measurement applies to Type VII only.

12/ Measure collar along neckline seam from finished center front edge to opposite center front edge. This measurement applies to Type VII only.

13/ Measurement taken from neckline seam to top of collar at center front. This measurement applies to Type VII only.

NOTE: All measurements shall be taken with the coat laid out flat and under no tension. Hood shall be laid flat and folded along the center back seam with the hook and loop fastener tape open.

TABLE VI. Chemical Protective Overgarment Trousers (inches)

MEASUREMENT	S/XS	S/S	M/S	M/R	M/L	L/R	L/L	XL/R	Tolerance
½ Waist <u>1/</u>	17	17	20	20	20	23	23	26	± 1
Inseam <u>2/</u>	28	30	30	32	34	32	34	32	± 1

1/ Measurement shall be taken across waist from side edge to side edge with snap fastener at waist secured and fly closed. The measurement shall be taken across the center of the waist tab adjustments.

2/ Measurement shall be taken along inseam from crotch seam to hemmed bottom of trouser

3.11 Workmanship. The finished coat and trouser shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

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Table VII

Requirements/Testing Verification Matrix								
Section 3 Requirements	Performance Parameter Title	Verification Method	Target Performance Value (TPV)	Verification Class				Section 4 Verification
				PQT	FAT	PLT	CAT	
3.4.1	Toxicity	Manufacturer supplied information and fabric sent to CHPPM for evaluation	Pass skin toxicity clearance	X				4.5.1
3.4.2.	Chemical Protection							4.5.2
3.4.2.1	Liquid/Vapor Challenge Agents after 45 days of field wear, 6 launderings and battlefield contaminants	DTC TOP 8-2-501	Upper 95% confidence limit of the geometric mean permeation computed from the logarithmic analysis of the swatch data; For GD equal to or less than 357.29 CT, for HD equal to or less than 671.24 CT, for VX, 83% of samples below minimum quantifiable level.	X				4.5.2.1
3.4.2.2	Fabric Under Stress	ATEC TOP 8-2-501	No penetration	X				4.5.2.2
3.4.2.3	Fabric Under Pressure	ATEC TOP 8-2-501	No penetration	X				4.5.2.3
3.4.2.4	Rainfall	ATEC TOP 8-2-501	No greater than 20% degradation below minimum protection levels	X				4.5.2.4
3.4.2.5	Operating Temp	MIL-STD-810F	No degradation below minimum protection levels	X				4.5.2.5
3.5.1.1	Liquid/Vapor Challenge Agents new/laundered without wear	DTC TOP 8-2-501	Samples shall achieve a one-sided "p-value" of greater than or equal to 0.01 when compared to the means for each agent type.		X	X		4.5.2.1
3.4.3	Integration							4.5.3
3.4.3.1	Vapor Protection	DTC TOP 10-2-022 (MIST)	Upper 95% confidence limit, computed from the logarithmic analysis of the data. Equal to or greater than: 1573 for systemic CT and 2138 for local CT	X				4.5.3.1

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3.4.3.2	Aerosol & Alpha/Beta Particle Protection	DTC TOP Aerosol Testing of Chemical Protective Clothing	Upper 95% confidence limit, computed from the logarithmic analysis of the data. Equal to or greater than: 3450 for systemic CT and 10,000 for local CT	X				4.5.3.2
3.5.1.3	Dimensional Stability	Visual Evaluation	Maximum 6% shrinkage	X	X	X		4.5.3.4
3.4.4	Durability							4.5.4
3.4.4.1	Wear Time	DTC TOP 10-2-021	Able to withstand 45 days wear (720 hours cumulative wear time) without damage or degradation below minimum protection levels	X				4.5.4.1
3.4.4.2	Storage	MIL-STD-810F	Able to withstand hot and cold testing parameters without degradation below minimum protection levels	X				4.5.4.2
3.5.1.3	Fabric Weight of Material System	ASTM D-3776, Option C, (with modification)	Not to exceed 18.2 oz/yd ²		X	X		4.5.4.3
3.5.2.2	Fabric Weight of Outershell Material	ASTM D-3776, Option C	Minimum of 6.2 oz/yd ²				X	4.5.4.3
3.5.2.1	Tear strength	ASTM D-1424	Minimum 7.0 pounds warp strength and 5.0 pounds filling strength				X	4.5.4.4
3.4.5	Heat Stress							4.5.5
3.4.5.1	Water Vapor Resistance	ISO Standard 11092	Not to exceed 9.6 m ² Pa/W	X				4.5.5.1
3.4.5.2	Heat Stress Ratio	JSLIST TOP Heat Stress Testing of Protective Clothing Materials and Ensembles	i _m /clo ratio greater than or equal to 0.21	X				4.5.5.2
3.4.5.3	Thermal Stress	JSLIST TOP Heat Stress Testing of Protective Clothing Materials and Ensembles	Allow continuous wear for 24 hours without causing thermal stress levels sufficient to negatively affect performance	X				4.5.5.3
3.5.1.4	Air permeability	ASTM D-737, at 0.1 inches of H ₂ O	1.0 to 1.6		X	X		4.5.5.4
3.4.6	Camouflage							4.5.6

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3.4.6.1	Color	Visual Assessment	Match standard for colors	X			X	4.5.6.1
3.4.6.2	Pattern Execution	Visual Assessment	Match standard for design, colors and registration	X			X	4.5.6.2
3.6.2.3	Spectral Reflectance	Visual Assessment	Measured reflectance factors for any color fail no more than 3 wavelengths	X			X	4.5.6.3

* Testing note: The manufacturer may propose alternative test methods, techniques, or equipment to verify the performance of their unique technology. The government retains the right of approval. If any lot fails government CAT, FAT and PLT testing, the laboratories conducting such testing will double-check all procedures and equipment, and will validate the results. If the government validation tests still indicate failures, the government contracting office shall notify the contractor, in writing, providing the test results. Failed items shall be retested by an independent laboratory acceptable to both the JSLIST Project Office and the contractor, if requested by the contractor. Failure in initial testing shall not be cause for rejection if retest results are in compliance with the requirements set forth in 3.5. Failure of such retest shall constitute failure of the lot. This paragraph does not apply to PQT.

4.0 Verification

4.1 Classification of inspection.

- a. Performance Qualification Testing (PQT)
- b. First Article Testing (FAT)
- c. Quality Conformance Inspections

4.2 Performance Qualification Testing (PQT). Periodically, the Government will conduct a Performance Qualification Testing (PQT) Program to solicit and potentially qualify new sources of material for use in the JSLIST overgarments. At the time a PQT program is conducted, the Government will release a Request for Proposal (RFP), or other form of solicitation, that will include detailed TOPs, Test plans, Evaluation Criteria, Test Item Control Plans and other pertinent information concerning participation by Industry in the PQT, including the quantities of material and number of garments required. Generally, the PQT shall consist of the requirements and inspection methods specified as the Performance Qualification Test (PQT) requirements in table VII. Performance Qualification Test (PQT) requirements are those requirements that any candidate must meet in order to be considered a qualified source for JSLIST garments. The government also reserves the right to conduct any additional tests or evaluations it deems necessary to fully assess acceptability of the candidates. If a candidate material or technology requires a modification to the Government controlled configuration of the suit, then Operational Testing will also be required. Failure of any test or examination included as part of PQT shall be cause for rejection of the candidate. The government retains the right to decide when to conduct production qualification testing and (if required) operational testing on all candidate garments. Only materials which are approved/qualified through a formal Government PQT program shall be considered as sources for material for JSLIST overgarment production contracts.

4.3 First article inspections. The first article inspections shall consist of examinations and tests performed to determine that the production item conforms to the requirements of this specification.

4.3.1 First article examinations. Unless otherwise specified, as soon as practical after the award of a contract, the manufacturer shall submit 3 of each size coat and 3 of each size trouser for a total of 48 garments. Each individual garment (coat and trouser) shall be examined for all defects specified in table VIII. Presence of any critical defect, or more than 2 major defects, or more than five combined (major and minor) defects shall be cause for rejection of First Article.

4.3.2 First article tests. Following the defects examination, 3 suits or 6 garments shall be subjected to the system tests as specified in the first article column of Table VII. Dimensional stability measurements shall be

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conducted prior to chemical agent protection testing. Failure of any first article test shall be cause for failure of the first article.

4.4 Quality Conformance inspections

4.4.1 Examinations.

4.4.1.1 Individual Critical Defect Examination. Every garment in every lot shall be examined for the critical defects as specified in Table VIII. Presence of any critical defect shall be cause for rejection of the garment.

4.4.1.2 Visual Examination. Sampling for visual examination shall be in accordance with ANSI/ASQC Z1.4. Samples selected shall be visually examined for defects listed in Table VIII. Presence of any critical defect shall be cause for rejection of the lot. Presence of more than 2 major defects, or more than five combined (major and minor) defects shall be cause for rejection of the lot.

4.4.2 Production Lot Testing (PLT). Production Lot testing shall be conducted on lots of completed garments submitted for acceptance. Sampling for production lot testing shall be indicated below. Each lot of coats or trousers shall contain items manufactured from the same lot of filter fabric liner material. Sampled items shall be subjected to the tests as specified in Table VII. Failure of any Production Lot Test shall be cause for rejection of the lot.

The sample size for Production Lot Testing shall be in accordance with the following:

<u>Lot size (suits produced with a single filter liner lot)</u>	<u>Sample size (each)</u>
Less than 5000	3 suits or six garments
5001 and over	5 suits or ten garments

4.4.3 Component acceptance testing. Component acceptance tests shall be performed on samples from each outer shell material lot prior to acceptance for use in producing suits. The samples shall be subjected to the CAT tests as specified in Table VII. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all component testing requirements. Except as otherwise specified in the contract or purchase order, the contractor 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 tests set forth in this section where such tests are deemed necessary to ensure supplies and services conform to prescribed requirements. Certificates of compliance for each lot of material may be submitted for acceptance of the lot.

4.5 Inspection procedures

4.5.1 Material toxicity. The U.S. Army Center for Health Promotion and Preventative Medicine (CHPPM) shall review data supplied by manufacturers pertaining to chemical composition, history of commercial use of the components in the marketplace and Material Safety Data Sheets. Human and animal toxicity studies, as well as epidemiological information for the product, must be provided if available. CHPPM shall review all data and issue a Toxicity Clearance if the product is suitable for its intended use from a standpoint of toxicity. (See paragraph 3.4.1.)

4.5.2 Chemical agent protection.

4.5.2.1 Liquid/vapor challenge agents. The test method for determining liquid agent penetration of the JSLIST overgarment shall be the U.S. Army Developmental Test Command Test Operations Procedures 8-2-501, "Permeation and Penetration Testing of Air-Permeable, Semipermeable, and Impermeable Materials With Chemical Agents or Simulants (Swatch Testing)." Submissions that do not meet the requirements specified in 3.4.2.1 and 3.5.1.1 shall be considered failures.

4.5.2.2 Mandrel test. The test method for determining liquid agent penetration under stress shall be the U.S. Army Developmental Test Command Test Operations Procedures 8-2-501, "Permeation and Penetration Testing

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of Air-Permeable, Semipermeable, and Impermeable Materials With Chemical Agents or Simulants (Swatch Testing).” Worn materials shall be challenged with GD and HD, subjected to stress and then checked for penetration. Submissions that do not meet the requirements specified in 3.4.2.2 shall be considered failures.

4.5.2.3 Expulsion test. The test method for determining liquid agent penetration when pressure is applied shall be the U.S. Army Developmental Test Command Test Operations Procedures 8-2-501, “Permeation and Penetration Testing of Air-Permeable, Semipermeable, and Impermeable Materials With Chemical Agents or Simulants (Swatch Testing).” Worn materials shall be challenged with GD and HD, subjected to pressure and then checked for penetration. Submissions that do not meet the requirements specified in 3.4.2.3 shall be considered failures.

4.5.2.4 Effects of rainfall on chemical protection. The test method for determining liquid agent penetration after exposure to rainfall shall be the U.S. Army Developmental Test Command Test Operations Procedures 8-2-501, “Permeation and Penetration Testing of Air-Permeable, Semipermeable, and Impermeable Materials With Chemical Agents or Simulants (Swatch Testing).” Worn materials shall be challenged with GD and HD, subjected to 30 minutes of simulated rainfall and then checked for penetration. Submissions that do not meet the requirements specified in 3.4.2.4 shall be considered failures.

4.5.2.5 Operating temperature chamber testing. Unpackaged suits shall be exposed to 3 conditions of operating temperatures (high temperature/dry¹, high temperature/high humidity², and cold temperature³) as defined in MIL-STD-810F. The suit test population shall be divided among the three conditions, each suit shall be subjected to one of the three conditions. The test duration shall be 45 days. During storage, suits shall be removed from bag and the material flexed to simulate donning and doffing twice daily. Suits in each condition shall then undergo chemical agent swatch testing (4.5.2.1) to determine the effects of extreme operating temperatures on the material. Additional details about sample sizes and testing parameters will be provided at the time a solicitation is issued for a PQT program. Submissions that do not meet the requirements specified in 3.4.2.5 shall be considered failures.

1. Hot-Dry: Conduct hot-dry cycle for 45 days IAW MIL-STD-810F, Method 501.4, Table 501.4-II, High Temperature Cycles, Climatic Category - Hot, Procedure II - Operation, Para. 4.5.3
2. Hot-Humid: Conduct hot-humid cycle for 45 days IAW MIL-STD-810F, Method 501.4, Table 501.4-I, High Temperature Cycles, Climatic Category - Basic Hot, Procedure II - Operation, Para. 4.5.3
3. Cold: Conduct cold cycle for 45 days at a constant -32°C IAW MIL-STD-810F, Method 502.4, Procedure III - Manipulation, Para. 4.5.4

4.5.3 Integration.

4.5.3.1 Vapor protection. The test method for estimating JSLIST overgarment penetration of chemical vapors shall be the U.S. Army Developmental Test Command Test Operations Procedure 10-2-022, “Man-In-Simulant (MIST) Test Operations Procedures (TOP).” Submissions that do not meet the requirements specified in 3.4.3.1 shall be considered failures.

4.5.3.2 Aerosol and alpha/beta particle protection. The test method for estimating JSLIST overgarment penetration of aerosol particles shall be the U.S. Army Developmental Test Command Test Operations Procedures for Aerosol Testing of Chemical Protective Clothing. Submissions that do not meet the requirements specified in 3.4.3.2 shall be considered failures.

4.5.3.3 Dimensional Stability. End items shall be laundered 6 times in accordance with Appendix A. After laundering, the following dimensions shall be measured in accordance with Tables V and Table VI:

Coat: chest, back length and sleeve inseam

Trouser: ½ waist and leg inseam

The dimensions shall be compared to the same dimensions on the individual garments taken prior to laundering and the percent shrinkage calculated. Laundered garments shall also be examined for the critical defects listed in Table VIII. Failure to meet the requirements of paragraph 3.5.1.2 shall be cause for rejection of the lot.

4.5.4 **Durability.**

4.5.4.1 Wear time. The test method for assessing JSLIST overgarment wear time shall be the U.S. Army Developmental Test Command Test Operating Procedure 10-2-021, "General Performance Tests of Combat Uniforms & Protective Equipment." Assigned military personnel shall wear JSLIST overgarments for a period of 45 days (720 cumulative hours). At the end of the test worn suits shall be subjected to chemical agent resistance testing (see paragraph 4.5.2.1). Each suit shall be laundered, per standard field laundering procedures, five times during the wear test and once at the end of the test. A manufacturer may propose alternate laundering procedures that are better suited to their unique technology. The alternative laundering procedure must be field supportable and is subject to government approval. Since the geographic location and mission of personnel assigned to the test will influence test results, the current JSLIST garment shall always be introduced to the test as a control item. Garment and closure failures (tears, rips, etc.) during the test shall be identified and scored based upon the JSLIST Failure Definition and Scoring Criteria (FD/SC). Additional details about sample sizes and the FD/SC will be provided at the time a solicitation is issued for a PQT. During the PQT candidate materials shall undergo physical property testing in order to determine those physical property tests that will be the most representative of durability for potential future PLT, FAT or CAT testing. Submissions that do not meet the requirements specified in 3.4.4.1 shall be considered failures.

4.5.4.2 Accelerated storage chamber testing. Packaged suits shall be subjected to accelerated storage for 60 days prior to wear testing. The condition parameters are the basic hot storage test protocol and the cold temperature cyclical storage protocol, both of which are contained in MIL-STD-810F. The storage conditions shall include temperatures from 0 to 90 deg F. Suits that under go Accelerated Storage Chamber Testing shall be identified and included in the wear test (4.5.4.1). Additional details about sample sizes and testing parameters will be provided at the time a solicitation is issued for a PQT program. Submissions that do not meet the requirements specified in 3.4.4.2 shall be considered failures.

4.5.4.3 Fabric weight. Material system weight testing and outer shell material weight testing shall be conducted per ASTM D-3776, Option C, except that the conditioning step shall not be conducted prior to measuring the fabric sytem weight; instead the following drying steps shall be taken prior to measuring the fabric system weight:

- 1) Dry the samples (100 cm²) at 105 +/- 3 °C for one hour
- 2) Remove samples from oven and quickly place them in a desiccator for 30 minutes
- 3) Remove the samples from the desiccator and quickly weigh them

Submissions that do not meet the requirements specified in 3.5.1.3 and 3.5.2.2 shall be considered failures.

4.5.4.4 Tear strength. Tear strength of the JSLIST outer shell material shall be tested in accordance with test method ASTM D-1424. Submissions that do not meet the requirements specified in 3.5.2.1 shall be considered failures.

4.5.5 **Heat stress.**

4.5.5.1 Guarded hot plate. The water vapor resistance value of the JSLIST overgarment material system shall be tested in accordance with the International Organization for Standardization (ISO) Standard 11092, "Measurement of Thermal and Water Vapor Resistance Under Steady-State Conditions (sweating guarded hot-plate test)." Submissions that do not meet the requirements specified in 3.4.5.1 shall be considered failures.

4.5.5.2 Thermal manikin. Heat stress ratio as measured by Thermal Manikin testing shall be tested in accordance with JSLIST Test Operating Procedure for Heat Stress Testing of Protective Clothing Materials and Ensembles. Submissions that do not meet the requirements specified in 3.4.5.2 shall be considered failures.

4.5.5.3 Controlled human subject testing. Heat strain evaluations conducted in an environmental chamber and /or during field tests shall be conducted in accordance with JSLIST Test Operating Procedure for Heat Stress Testing of Protective Clothing Materials and Ensembles. Submissions that do not meet the requirements specified in 3.4.5.3 shall be considered failures.

4.5.5.4 Air permeability. Air permeability of the JSLIST overgarment material system shall be tested in accordance with ASTM D-737, at 0.1 inches of H₂O. Submissions that do not meet the requirements specified in 3.5.1.4 shall be considered failures.

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4.5.6 Camouflage.

4.5.6.1 Color. The color of the finished JSLIST outershell material shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of $7500 \pm 200^\circ \text{K}$, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at $2300 \pm 200^\circ \text{K}$. Submissions that do not meet the requirements specified in 3.4.6.1 shall be considered failures.

4.5.6.2 Pattern execution . The pattern shall be visually assessed to match the standard for design, colors, and registration (see 2.2.2). Submissions that do not meet the requirements specified in 3.4.6.2 shall be considered failures.

4.5.6.3 Spectral reflectance Spectral reflectance testing shall be conducted on the JSLIST outershell material. Spectral reflectance data shall be obtained from 600 to 860 nanometers (nm) for the Woodland pattern, and 700 to 860 nm for Desert pattern at 20 nm intervals, on a spectrophotometer for each color in the pattern, relative to a barium sulfate standard; the preferred white reference standard. Other white reference materials may be used, providing they are calibrated to absolute white: for example, magnesium oxide or vitrolite tiles. The spectral bandwidth of the instrument shall be less than 26 nm at 860 nm. Reflectance measurements can be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a source that simulates CIE Source A or CIE Source D65. The specimen shall be viewed at an angle no greater than 10 degrees from normal, with specular component included. Photometric accuracy of the spectrophotometer shall be within 1 % and wavelength accuracy within 2 nm. The standard aperture size used in the color measurement device shall be 1.0 to 1.25 inches in diameter. Areas to be measured for each color shall be lightly marked with a circle, at least 1.5 inches in diameter, on the reverse side of the fabric and at least 6 inches from the selvage. The specimen shall be measured as a single layer backed with layers of the same fabric and shade. Required backing layers can be determined by measuring the specimen with increasing layers of the same material and shade, until no further change in reflectance factor is observed. When presented to the sample port, the specimen shall be oriented so that the filling direction is parallel with the horizontal plane. Measurements shall be taken on a minimum of two different areas and the data averaged. When the measured reflectance factors for any color at four or more wavelengths do not meet the limits referenced in 3.4.6.3 for the camouflage and woodland patterns, the material shall be considered a failure.

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine	Defect		
	Critical	Major	Minor

Note: Defects listed under Coat and Trousers may also be listed under individual component defects. Any defect discovered under this circumstance shall be counted once, using the classification of the individual component defect.

COAT AND TROUSERS

1. Fabric Defects and Damages	Applicable to lining fabric:		
	a. Any cut, tear, needle chew, hole, or burn thru the lining fabric:		
	- 1/16 to 1/8 inch long inclusive		101
	- more than 1/8 inch long	1	
	b. Any mend:		
	- more than 1-1/4 inches in longest direction		102
	- more than two mends per garment		103
	Applicable to outershell fabric:		
	a. Any hole, needle chew, cut, tear, or burn thru outershell fabric:		
	- 1/16 to 1/8 inch long inclusive		104
	- more than 1/8 inch long	2	
	b. Mends:		
	- any mend up to 1/4 inch in diameter or length		201
	- any mend more than 1/4 inch in diameter or length		105
	- more than two mends		106
	c. Any defect such as a smash, or multiple float		202
	d. Any misweave, area of poor dye penetration dye streak, broken or missing yarn, thin place, or shade bar.		203
	e. Any hole, cut, tear, mend, or needle holes in elbow patch reinforcement, seat patch, or knee patch reinforcement.		107
	f. Any hole, cut, tear, mend or needle holes in cargo pocket reinforcement, patch pocket reinforcement, sleeve pocket reinforcement:		
	- up to and including 1/4 inch		204
	- over 1/4 inch		108
	g. Printed side not facing outward		109
2. Marking	a. Metal fastening device present		110
	b. Sew-on type marking used		111
	c. Discoloration caused by adhesive ticket		205
	d. Paper adhesive left on fabric		206
	e. Punched or drilled holes present	3	
3. Shaded Parts	a. Any outside part shaded except those parts listed in 3.9.4.1		207
4. Cleanness	a. Spot or stain (grease, oil, ink, etc.)		208
	Note: Stains attributed to charcoal content of lining should not be scored.		
	b. Five or more thread ends in excess of 1/2 inch, not trimmed		209

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Defect		
		Critical	Major	Minor
	from coat or trousers.			
	c. Two or more shade or size tickets or loose threads not removed from coat or trousers			210
5. Components and Assembly	a. Any component part or required and assembly operation omitted, unless otherwise specified		112	
	b. Any operation not as specified, unless otherwise classified herein			211
	c. Any component not as specified, unless otherwise classified herein		113	
	d. Any dimension not as specified, unless otherwise classified herein		114	
6. Cutting	a. Any part not cut in accordance with directional lines indicated on pattern or not in accordance with specified requirements		115	
7. Seams and Stitching	Accuracy of seaming:			
	a. Seams twisted, puckered, or pleated (unless otherwise classified herein)			212
	b. Part of garment caught in unrelated operation or stitching		116	
	c. Ends of seams or stitching produced with 301 stitch type, when not caught in other seams or stitching, backtacked less than 1/2 or more than 3/4 inch			213
	d. Stitching overlapping end(s) of thread breaks less than 1/2 or more than 3/4 inch			214
	e. Different shades of thread used on outside of same coat or trousers			215
	f. Ends of a continuous line of stitching not overlapped or overlapped less than 1/2 or more than 3/4 inch			216
	g. Stitch repairs not made as specified			217
	Gage/margin of stitching:			
	a. Gage of double needle stitching more or less than specified		117	
	b. Margin of edge or raised stitching more or less than specified:			
	- up to length of 2 inches inclusive			218
	- beyond 2 inches in length		118	
	Open seam:			
	a. Any open joining seam of lining except those listed in c below:			
	- up to a length of 1/4 inch inclusive			219
	- over 1/4 but not greater than 7/8 inch in length inclusive		119	
	- more than 7/8 inch in length	4		
	b. Any open seam except joining of lining and those listed in c below			
	- up to a length of 1/2 inch inclusive			220
	- more than 1/2 inch in length		120	
	c. Any open seam on coat bottom hem, outside hood or collar,			

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine	Critical	Defect	
		Major	Minor
trouser waistband turn under, trouser leg hem, sleeve hem, pocket stitching, zipper tape, or slide fastener flap:			
- up to a length of 1/4 inch inclusive			221
- over 1/4 but not greater than 7/8 inch in length inclusive		121	
- more than 7/8 inch in length	5		
NOTE: One or more broken stitches or two or more continuous skipped or runoff stitches on joining seam constitutes an open seam. On double stitched seams, a seam is considered open when one or both sides of the seam is open.			
d. 607 seams not constructed with raw edges over lapped without spacing	6		
Raw Edges:			
a. On outside:			
- up to a length of 1/4 inch inclusive			222
- more than 1/4 inch in length		122	
b. On inside:			
- any raw edge more than 1/2 inch in length (where edge is required to be turned in)			223
NOTE: Raw edges not securely caught in stitching shall be classified as an open seam.			
Runoffs:			
a. Joining seams: When resulting in an open seam, use "open seam" classification.			
b. Edge or raised stitching (when not resulting in any open seam):			
- 1/2 to 1 inch in length inclusive			224
- more than 1 inch		123	
Seam and stitch type:			
a. Wrong seam or stitch type		124	
b. Looper thread of 401 stitch type finishing on outside of coat or trousers		125	
c. Wrong thread size or type		126	
Stitch tension:			
a. Loose tension, up to 1 inch (excluding lining fabric)			225
b. Loose tension, more than 1 inch (excluding lining)		127	
c. Loose tension, up to 1 inch on lining		128	
d. Loose tension, more than 1 inch on lining	7		
e. Loose tension on edge of raised stitching			226
f. Tight tension (stitches break when normal strain is applied to the seam or stitching)		129	

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine	Critical	Defect Major	Minor
NOTE: Puckering is evidence of tight tension. When puckering is evident, seam shall be tested by exerting pull in lengthwise direction of seam or stitching. Failure of seam to straighten or thread breakage shall be evidence of tight tension.			
Stitches per inch (To be scored only when the condition exists on major portions of the seam):			
a. Less than specified:			
- one or two stitches		130	227
- more than two stitches			
b. More than specified			
- one or two stitches		131	228
- more than two stitches			
Skipped or broken stitches in any location (other than Specified under defect c, open seam classification):			
a. Up to a length of 1/4 inch inclusive			229
b. Over 1/4 but not greater than 7/8 inch in length inclusive		132	
c. More than 7/8 inch in length	8		
Bartacks:			
a. Bartack stitching loose or tight causing needle cutting, incomplete, broken, not fully engaging stitched fabric, or not as specified:			
- involving one bartack			230
- involving two or more bartacks		133	
b. Any bartack missing or not as specified		134	
8. Hook and Pile (Loop) Fastener Tape			
a. Hook and loop not as specified		135	
b. Any cut, hole, or tear		136	
c. Hook or loop tape flattened making it non-functional		137	
d. Any spot, stain, or streak			231
e. Not positioned as specified		138	
f. Cut length of hook and loop tape not as specified		139	
g. Position of hook and loop tape reversed			232
h. Fastener tape missing	9		
i. Hook and loop fastener tape stitched less than 1/8 or more than 3/16 inch from edge		140	
9. Sewn Eyelets			
a. Not as specified			233
b. Not in specified position			234
10. Metal Eyelet			
a. Not as specified		141	
b. Not type, class, or size specified			235
c. Omitted, damaged, or malformed		142	
d. Improperly clinched		143	

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Critical	Defect	
			Major	Minor
	e. Reinforcement piece omitted			236
	f. Reinforcement piece improperly located			237
	g. Reinforcement piece not flat and uniformly fitting			238
	h. No nicks, lifts, or uneven flattening	10		
	i. No fabric tearing or deformation		144	
11. Slide Fastener	a. Shade not as specified			239
	b. Any part of zipper assembly omitted, bent, broken, cracked, or otherwise defective, affecting function	11		
	c. Not specified type, size, or material		145	
	d. Fastener tape cut or torn		146	
	e. Thong omitted on zipper pull		147	
	NOTE: The zippers shall be fully closed and opened to determine if the zippers are operable and provide a smooth secure closure.			
12. Snap Fastener	a. Any snap omitted, mismatched, bent, broken, or nicked		148	
	b. Any fastener not functioning properly (i.e., fails to snap closed, provide a secure closure, or separate freely)	12		
	NOTE: The fasteners shall be snapped and unsnapped twice to determine whether parts of fasteners separate freely and also effect a secure closure.			
	c. Clinched excessively tight, cutting adjacent fabric, fabric tearing, or fabric deformation		149	
	d. Clinched loosely to the degree that components can become detached during use	13		
	e. Clinched loosely, permitting any component to rotate freely but not to the degree that any component can become detached during use		150	
	NOTE: Incomplete roll of end of the button or the Metal Eyelet Barrel is evidence of improper and insecure clinching.			
	f. Incorrect style		151	
	g. More than three splits in Metal Eyelet or button barrel			240
	h. Not aligned with each other creating bulge or twist when closed			241
	i. Not located on coat retention cord holder as specified		152	
13. Reinforcement Pieces	a. Any reinforcement piece missing		153	
	b. Any reinforcement piece out of position by more than 1/4 inch			242
14. Labels	a. Labels not positioned and attached as specified			243
	b. Labels missing, incorrect, or illegible		154	
	c. Surveillance marking omitted, incorrect or illegible		155	
	d. Label not stitched on all four sides			244
	e. Stitching through printed portion of label			245
	f. Label not as specified			246

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Critical	Defect Major	Minor
<u>COAT</u>				
1. Pockets and Flaps	a. Sleeve pocket reinforcement not extended beyond side and bottom edges of pocket and flap		156	
	b. Edges of pockets pleated or twisted in stitching			247
	c. Raw edges of pocket hems not turned in			248
	d. Bellows portion of sleeve pocket positioned toward front of pocket		157	
	e. Sleeve pocket set on crookedly or poorly shaped			249
	f. Flap not covering front or back edge of pocket by 3/16 inch or more			250
	g. Hook and loop omitted or improperly placed			251
	h. Cut lengths of hook or loop tape for pocket not as specified			252
	i. Pocket flap tight causing fullness, twisting or curling of pocket flap			253
	j. Bartack on pocket or flap omitted			254
2. Slide Fastener	a. Top ends of tape not turned under and caught in the stitching joining zipper to coat			255
	b. Top stop less than 1/4 inch or more than 3/8 inch from neck edge, or bottom edge of tape more than 1/4 inch from bottom of coat or extending beyond bottom edge			256
3. Slide Fastener Flap	a. Zipper positioned on wrong side of flap		158	
4. Hood	a. Hood channel not cut on bias			257
	b. An equal amount of hood drawcord not exposed on outside of stitched eyelet			258
	c. Hood drawcord not secured with bartack			259
5. Collar	a. Edges of collar end out of alignment by more than 1/4 inch (place shoulder together and extend collar ends to determine alignment)			260
	b. Hook or loop fastener tape finishing less than 3/16 inch from top of finished collar edge		159	
6. Sleeves	a. Ends of underarm seam and side seam staggered more than 1/2 inch (measured from center of doublestitching to center of doublestitching)		160	
	b. Sleeve tab set on crooked, not square, or not parallel to hem of sleeve			261
	c. Sleeve tab and loop tape out of alignment (measured at point of attachment to finished hem bottom in parallel direction):			
	- more than 1/8 and less than 1/4 inch			262
	- 1/4 inch or more		161	
	d. Sleeve tab and loop tape not able to be fastened	14		
	e. Length or width of sleeve tab not as specified		162	
	f. Hook fastener tape placement more or less than 1 inch			263

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Critical	Defect	
			Major	Minor
	from finished end of pull tab			
	g. Cut length of hook or loop tape for sleeve adjustment not as specified		163	
7. Sleeve Seams	a. Fronts not lapped over backs at sides and sleeve underarm			264
	b. Raglan sleeve seam not over fronts and backs			265
	c. Sleeve hem less than 7/8 inch or more than 1-1/8 inch			266
8. Coat Lining	a. Correct side of lining fabric not finishing toward the inside of coat	15		
	b. Seam allowance not finishing toward the outershell		164	
	c. Loop side of 607 stitch not finishing towards the outershell		165	
9. Bottom Hem	a. Elastic drawcord caught in the stitching at front			267
	b. Hem width less than 1-1/8 inch or more than 1-3/8 inch			268
	NOTE: Pull on drawcord to determine attachment of Drawcord at front bartacks			
10. Drawcord	a. Any end not treated to prevent unraveling			269
	b. Knot omitted on end of one or more cords			270
	c. Treating less than 1/2 inch in length			271
	d. Any hood drawcord less than 27 or more than 29 inches		166	
	e. Coat retention cord not as specified		167	
11. Cord Locks	a. Not as specified			272
	b. Not type or size specified			273
	c. Omitted, damaged, or not functional		168	
	d. Cord lock not facing away from the wearer as worn			274
12. Dimensional	a. Any measurement deviating from any dimensions specified in Table V		169	
	b. Sleeve lengths uneven by more than 1/2 inch		170	
<u>TROUSERS</u>				
1. Suspender Clips and Slide	a. Not as specified			275
	b. Not type or size specified			276
	c. Omitted, damaged, or not functional		171	
2. Cargo Pockets and Flaps	a. Pleats not turned towards back			277
	b. Bellows side not finished towards back			278
	c. Pocket flap not meeting length and width tolerance			279
	d. Pocket flap not completely covering pocket opening		172	
	e. Hook and loop omitted or improperly placed			280
	f. Raw edge of pocket hems not turned in			281
	g. Pocket flap tight causing fullness, twisting, or curling			282
	h. Edge of pockets pleated or twisted in stitching			283
	i. Pocket and pocket flaps out of alignment with each			284

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Defect	
		Critical	Major Minor
	other by more than 1/4 inch		
	j. Pocket reinforcement not extended beyond side or bottom edges of pocket or flap		173
	k. Top of pockets or pocket flaps out of alignment, at any corresponding point by more than 1/2 inch when measured from top edge of finished waist		285
	l. Bartack on pocket or flap omitted		286
3. Patch Pockets and Flaps			
	a. Pocket flap not meeting length and width tolerance		287
	b. Pocket flap not completely covering pocket opening	174	
	c. Hook and loop omitted or improperly placed		288
	d. Raw edge of pocket hems not turned in		289
	e. Pocket flap tight causing fullness, twisting, or curling		290
	f. Edge of pockets pleated or twisted in stitching		291
	g. Pocket and pocket flaps out of alignment with each other by more than 1/4 inch		292
	h. Pocket reinforcement not extended beyond side or bottom edges of pocket or flap	175	
	i. Top of pockets or pocket flaps out of alignment at any corresponding point by more than 1/2 inch when measured from top edge of finished waist		293
	j. Bartack on pocket or flap omitted		294
4. Waist Tab Adjustment			
	a. Improperly attached, causing strap to finish on reverse side or to function improperly	176	
	b. Edges of nylon webbing not heat sealed		295
	c. Elastic webbing not positioned as specified	177	
	d. Waist adjustment tab not box-X stitched		296
	e. Position of hook and pile tape not as specified on pattern	178	
	f. Waist tab elastic not caught under bartack		297
	g. Waist tab not attached to trousers	179	
5. Suspenders			
	a. Webbing not cut to length specified	180	
	b. Suspenders not boxtacked as specified		298
	c. Suspenders not bartacked as specified		299
	d. Suspenders not constructed as specified	181	
6. Front Opening			
	a. Top stop on zipper tape less than 1-1/4 or more than 1-1/2 inches from finished top edge of waist	182	
	b. Back edge of zipper chain extending less than 1/8 or more than 1/4 inch beyond right front edge of opening		300
	c. Double stud snap fastener not secured to right front		301
	d. Bottom stop missing on zipper	183	
	e. Back and bottom edge of fly protective flap not forming J-stitching	184	
	f. Bartacks not located as specified		302
7. Finished Waist			
	a. Top hem turned down less than 5/8 or more than 7/8 inch		303
8. Inseam, Crotch			
	a. Front inseam not lapping back		304

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TABLE VIII END ITEM VISUAL EXAMINATION

Examine		Critical	Defect	
			Major	Minor
Seam, and Seat Seam	b. Left fly front not lapping right fly front		185	
	c. Crotch and seat seam staggered more than 1/2 inch			305
	d. Stitching joining outershell to lining extending shell to lining less than 1-1/4 or more than 1-1/2 inches below fly opening, or extending less than 3/4 or more than 1 inch above fly opening			306
	e. Stitching joining outershell to lining extending less than 3/16 or more than 5/16 inches across fly, or not superimposed on inside row of crotch joining seam			307
9. Legs	a. Finished bottom hem less than 1/2 or more than 3/4 inch			308
	b. Leg tab set on crooked, not square, or not parallel to hem of leg			309
	c. Leg tab and loop tape out of alignment (measured at point of attachment to finished hem bottom in parallel direction):			
	- more than 1/8 and less than 1/4 inch			310
	- 1/4 inch or more		186	
	d. Leg tab and loop tape not able to be fastened	16		
	e. Length or width of leg tabs not as specified			311
	f. Hook fastener tape placement more or less than 1 inch from finished end of pull tab			312
	g. Cut length of hook or loop tape for leg adjustment not as specified		187	
	h. Leg lengths uneven by more than 1/2 inch			313
10. Trouser Lining	a. Right side of lining not finishing toward the inside of trouser	17		
	b. Looper side of 607 stitch not finishing toward the outershell		188	
11. Dimensional	a. Any measurement deviating from any dimensions specified in Table VI		189	
	b. Leg lengths uneven by more than 1/2 inch		190	

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5. PACKAGING. For acquisition purposes, the contract or order shall specify packaging requirements. When DoD personnel perform material packaging, those personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. The Inventory Control Point packaging activity within the Military Department of Defense Agency, or within the Military Department's System Command, maintains packaging requirements. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity. The following shall be a guideline for tailoring packaging instructions.

Appendix B – Packaging Instructions

Preservation.

Level A. One coat and one storage bag (in coat folds), or one trouser and one storage bag (in trouser folds) shall be packaged in a barrier bag. The 4.0 mil recloseable polyethylene storage bag shall have approximate inside dimensions of 14 x 24 inches. The storage bag shall be folded so that the zipper is not creased. The barrier bag shall have the approximate inside dimensions of 12 x 20 inches. The bag shall be constructed from tan or green colored (as appropriate to the required garment class), flexible, multi-layer formable foil film with an opaque finish. Or, the bag shall be constructed from tan or green colored (as appropriate to the required garment class), flexible, multi-layer nylon foil film with an opaque finish.

The formable foil film shall be constructed as follows:

- .0012 in. Oriented Polypropylene Adhesive Layer
- .00175 in. Aluminum Foil Adhesive Layer
- .003 in. Cast Polypropylene

The nylon foil film shall be constructed as follows:

- 60g Nylon
- .0005 in. Polyethylene
- .00035 in. Aluminum Foil
- .0022 in. Polyethylene

The film shall conform to the following physical requirements:

Packaging Material Requirements

Barrier bags shall have a tear, nick, or "V" notch, one eighth (1/8) inch deep in at least one edge, two (2) inches from the end of the bag.

The coat or trouser shall be unzipped in the packaging. Each storage bag shall be folded and placed in the folds of the coat or trousers. Snaps and hook and pile (loop) fastener tape shall be fastened. Coat or trousers shall be folded with slide fastener and snaps to the inside. One coat or trouser shall be placed in each barrier bag. The package shall be heat sealed to a minimum strength of 10 pounds per linear inch when tested in accordance with the above table. The package shall be firm and compact when inspected visually and manually. Any unacceptable packages shall be repackaged. Each package shall be placed in a 3.0 mil polyethylene overbag with vent holes and the closure heat sealed.

6.0 NOTES

6.1 Notes This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

6.2 Intended use. The suit is intended for use by combat personnel to provide protection against concentrations of chemical agents in liquid, vapor, or aerosol form.

6.3 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification

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- b. Special provisions for verification inspection of Life Support Clothing and Equipment (see 1.1).
- c. Type, class and size (see 1.2).
- d. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- e. When a first article is required (see 3.1, 4.3, and 6.4).
- f. Sampling plan, lot size, sample size for FAT, CAT, and PLT

6.4 First article. When a first article is required, it should be inspected and approved in accordance with the appropriate provisions of this specification and the purchase document. The first article should be preproduction samples. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article. (See 3.1 and 4.3)

6.5 Guide sample. For access to the guide sample, address inquiries to the procuring activity issuing the invitation for bids or request for proposal (see 3.2).

6.6 Protection of in-process and processed goods. Processed goods should be protected from exposure to chemical vapors.

6.7 Subject (key word) listing:

Chemical Warfare Agent
 Combat
 Disposable
 Expendable clothing
 Protection

6.8 Equal item. Prior to the use of an "or equal" item, the suppliers are required to submit the item with supporting data to the contracting office for subsequent approval or disapproval by the responsible military agency.

6.9 Source of supply for barrel lock, suspender clips, and slide. It has been determined that the following supplier is capable of meeting double barrel cord lock, fastener (slide release, and slide (triglide)) requirements (see 3.6.6, 3.6.11, 3.6.12).

ITW Nexus Barreloc
 Part No. 309-000
 230 West Gerry Drive
 Woodale, Illinois 60191

6.10 Source of supply for laundry detergent. It has been determined that the following supplier is capable of meeting the laundry detergent requirements.

Cosco Company
 Brooklyn New York
 (718) 383-4488

SUPPLIES

Type II detergent (non-phosphate): P-D-245
 National Stock Number (NSN) 7930-00-252-6797

6.11 Source of supply for washing machine. It has been determined that the following supplier is capable of meeting the washing machine requirements (see Appendix A).

Tellerin Milnor
 Kenner, LA 70062
 (504) 467-9591

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6.12 Sources of materials for measuring spectral reflectance.

Spectrophotometers: Suitable spectrophotometers for measuring spectral reflectance in the visible/near-infrared include the Diano-Hardy, the Diano Match Scan, Milton Roy Match Scan 2, Hunter D-54P-IR, Applied Color Systems Spectro Sensor I, II and CS-5, Hunter VIS/NIR Spectrocolorimeter and Macbeth 1500 with IR options.

White standard: Barium sulfate of suitable quality for use as a white standard is available from the Eastman Kodak Company. The same source has magnesium oxide ribbon available. Suitable white tiles can be obtained from the instrument manufacturers.

6.13 Source of supply for reflective fabric. It has been determined that the following supplier is capable of meeting the reflective fabric requirements (see 3.6.13)

3M
Personal Safety Products
3M Safety and Security Systems Division
3M Center, Building 225-4N-14
PO Box 33225
St. Paul, MN 55133-3225
(651) 733-7632

6.14 Sources of supply for packaging material and fabricating foil bags. Sources of supply are as listed in Appendix B.

6.15 Coat and Trouser Identification Labels. As an alternative to the labels specified in MIL-DTL-32075, Type VI, Class 14, the material for the label may be a white, 7 mil spunbonded polyolefin tag material with a surface specifically formulated for transfer printing, conforming to style Brady B-411 or equal (see 6.8). The colorfastness, print type, print format, label spacing and label content should be the same as that specified for the Type VI, Class 14 label. Approximate dimensions of the alternative label are 3 inches in width by 5 3/8 inches in height.

6.16 Surveillance program. Items to be set aside for surveillance (five (5) coats and five (5) trousers each filter liner lot) should be shipped separately to the address below indicating the point contact stated in the contract:

Special Projects
Project Code R4J-Bldg 1341
814 Radford Blvd
Marine Corps Logistics Base
Albany, GA 31704

6.17 Definitions.

Performance Qualification Test (PQT). A test that a candidate material system and garment must pass in order to become a qualified source for production of JSLIST garment. Pass/Fail performance criteria is given in section 3.

First Article Test (FAT). A test administered to the first lot of newly qualified production JSLIST material system and garments. Garments subject to FATs are configurations that have previously successfully completed all PQTs.

Production Lot Test (PLT). A test administered on an ongoing basis to JSLIST garments in current production. Garments subject to PLTs are configurations that have previously successfully completed all PQTs and FATs.

Component Acceptance Test (CAT). A test administered to qualified production JSLIST component material (outer shell material or inner filter liner material) prior to it being assembled into a complete garment.

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Filter Fabric Liner Lot. A quantity of filter fabric produced in one production run of filter fabric. It may be mated with outershell materials from various lots.

Outer Shell Production Lot. A quantity of outer shell fabric produced in one production run of outer shell fabric.
Military Interests:

Custodians:

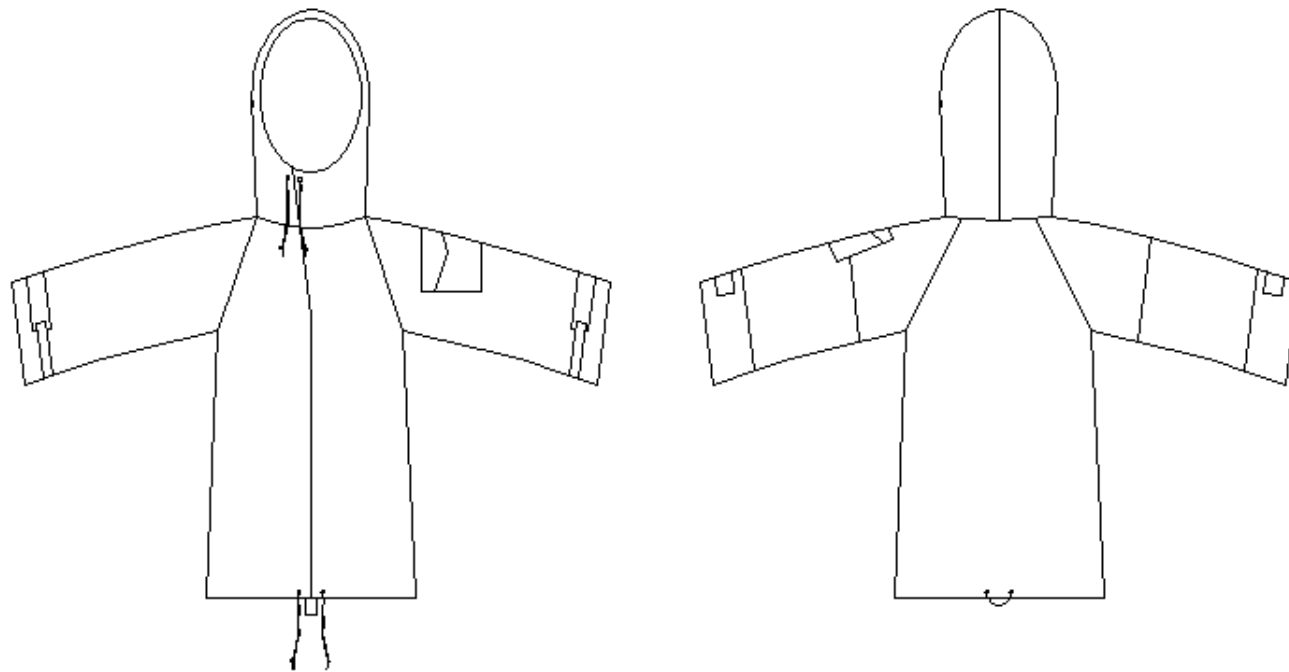
Army – GL
Navy – MC
Air Force – 11.6

Preparing activity:

DLA - CT
(Project 8415-0234)

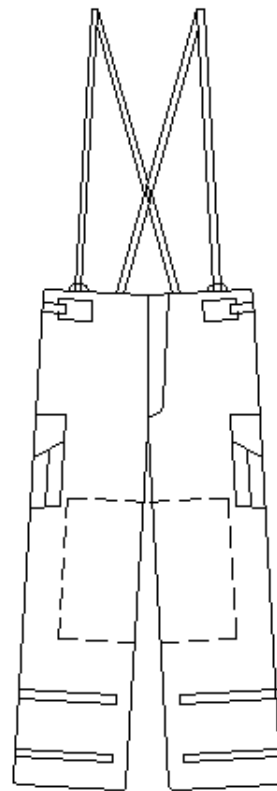
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Figure 1
Coat , Overgarment, Chemical Protective, Non-Flame Resistant, Type II

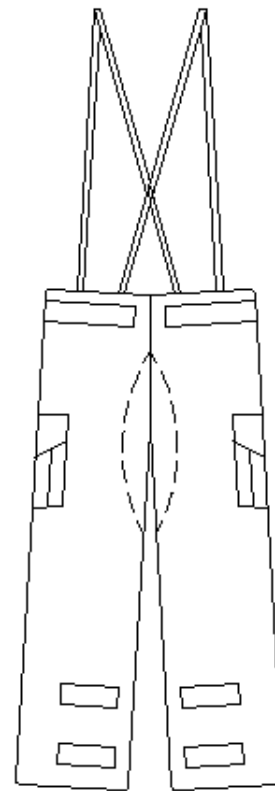


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Figure 2
Trouser , Overgarment, Chemical Protective, Non-Flame Resistant, Type II



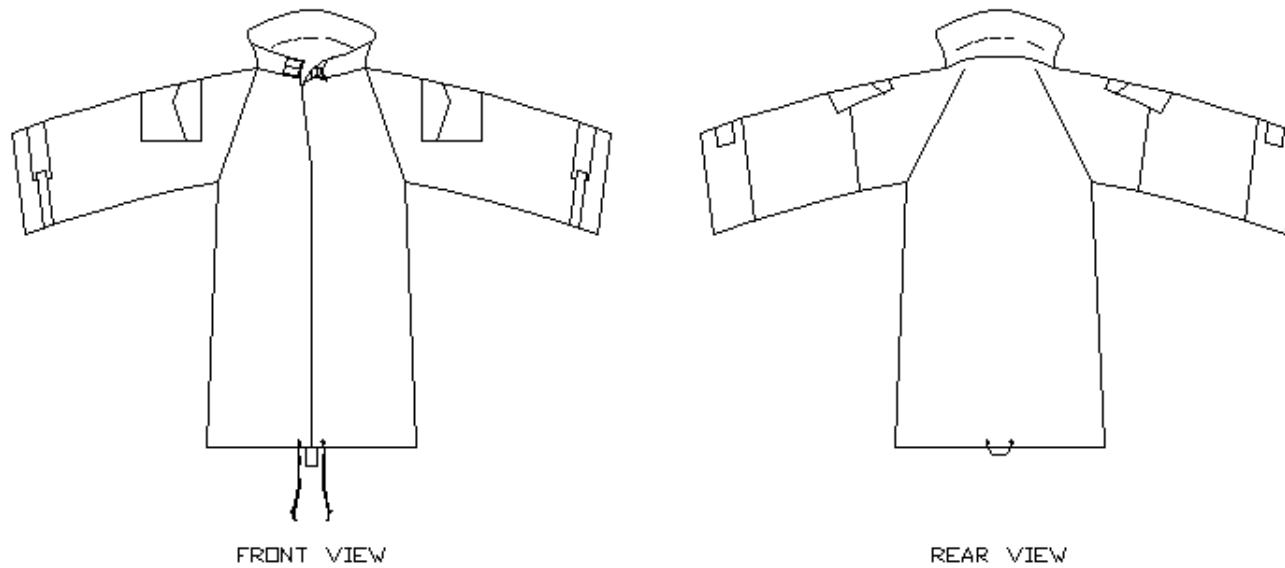
FRONT VIEW



REAR VIEW

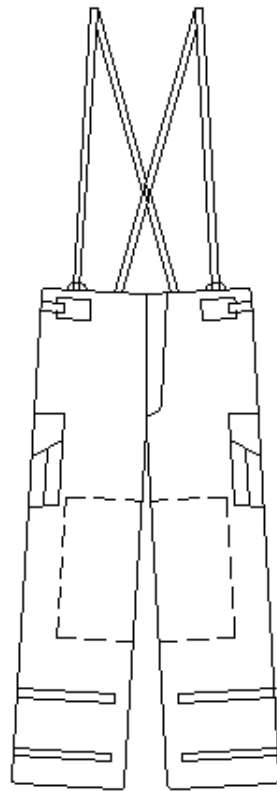
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Figure 3
Coat, Overgarment, Special Operations Forces, Chemical Protective, Non-Flame Resistant, Type VII

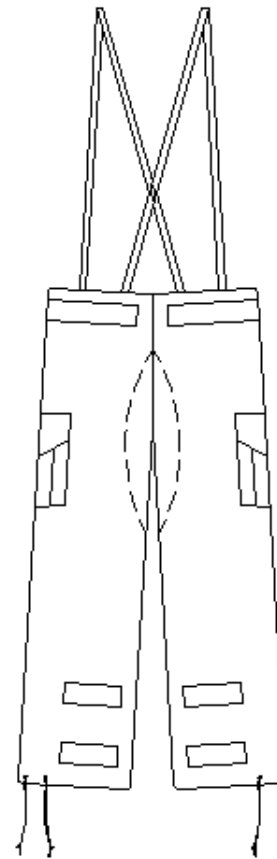


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Figure 4
Trouser, Overgarment, Special Operations Forces, Chemical Protective, Non-Flame Resistant, Type VII

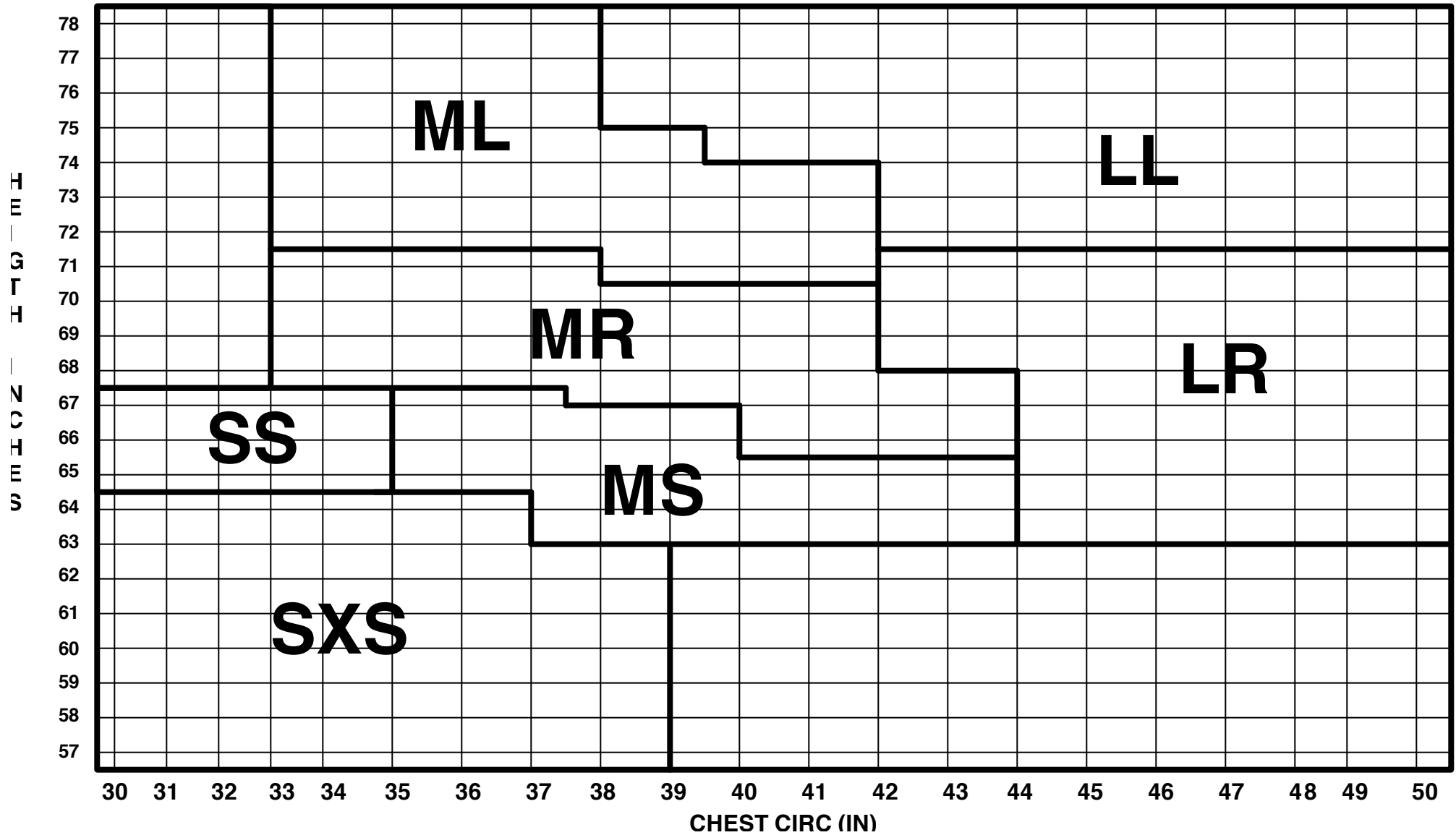


FRONT VIEW



REAR VIEW

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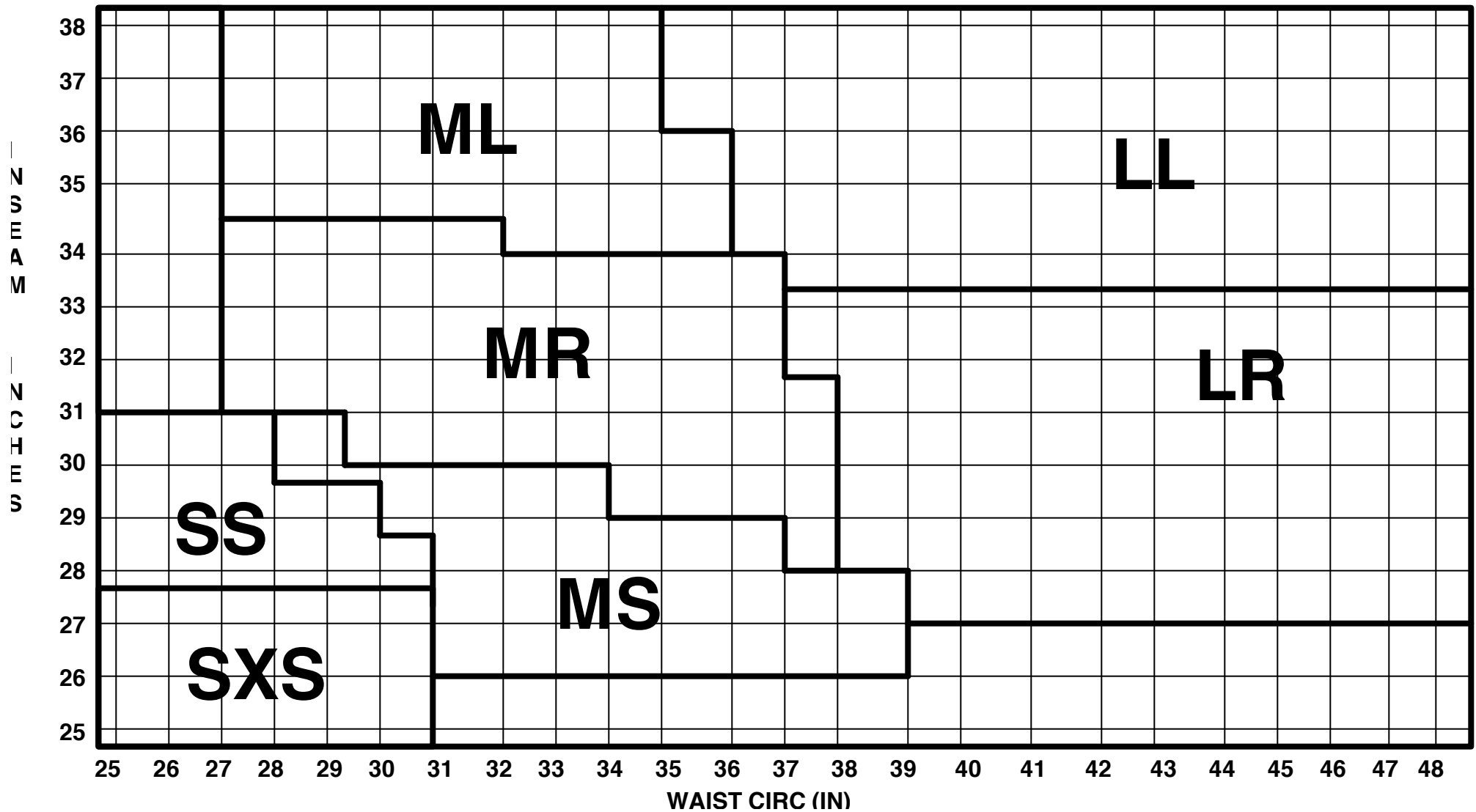
FIGURE 5. JSLIST COAT SIZE SELECTION CHART

SIZE SXS = Small Extra Short
SS = Small Short

MS = Medium Short
MR = Medium Regular
ML = Medium Long

LR = Large Regular
LL = Large Long

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FIGURE 6. JSLIST T ROUSERS SIZE SELECTION CHART

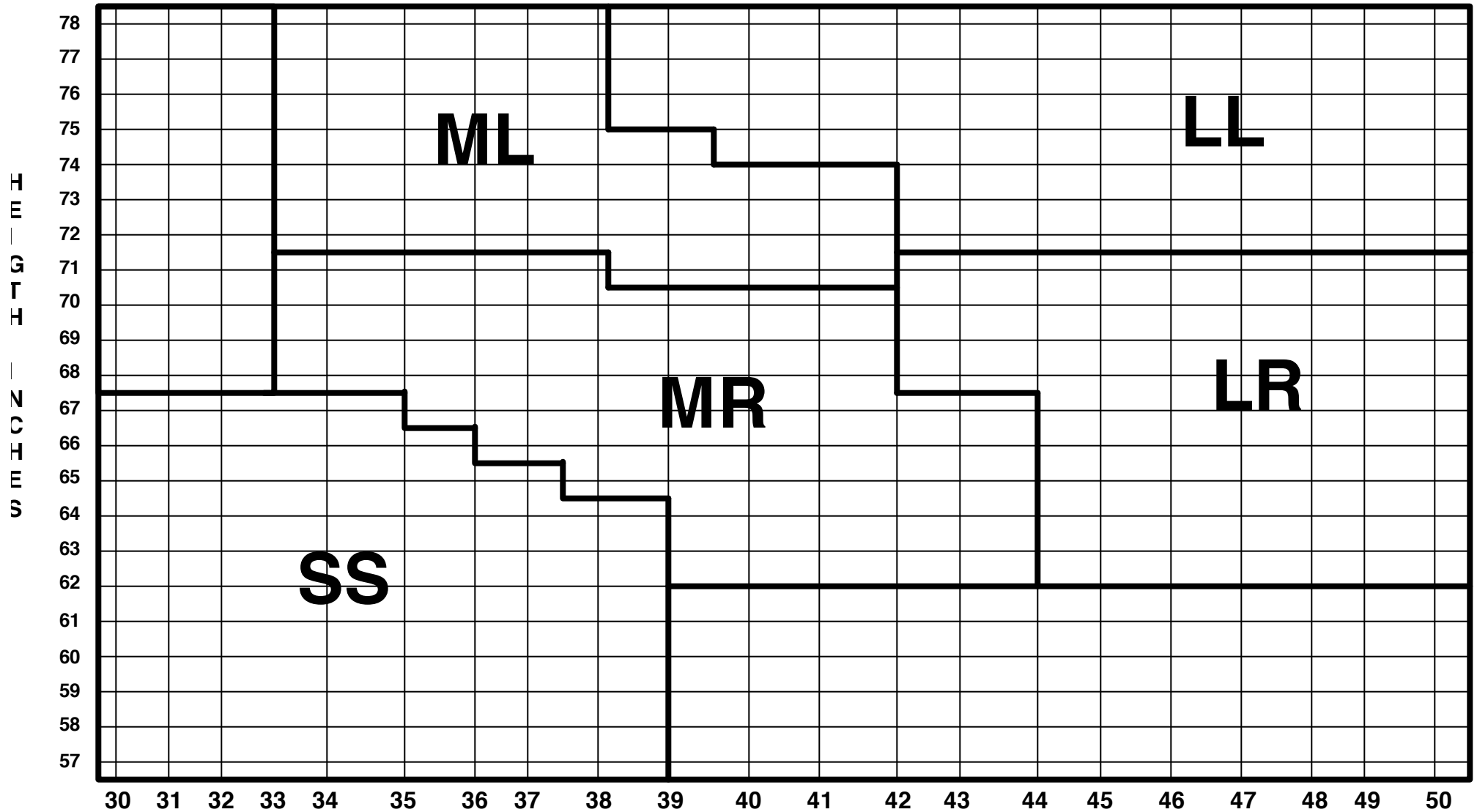
SIZE SXS = Small Extra Short
SS = Small Short

MS = Medium Short
MR = Medium Regular
ML = Medium Long

LR = Large Regular
LL = Large Long

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**FIGURE 7. JSLIST COAT SIZE SELECTION CHART
(Navy Only)**



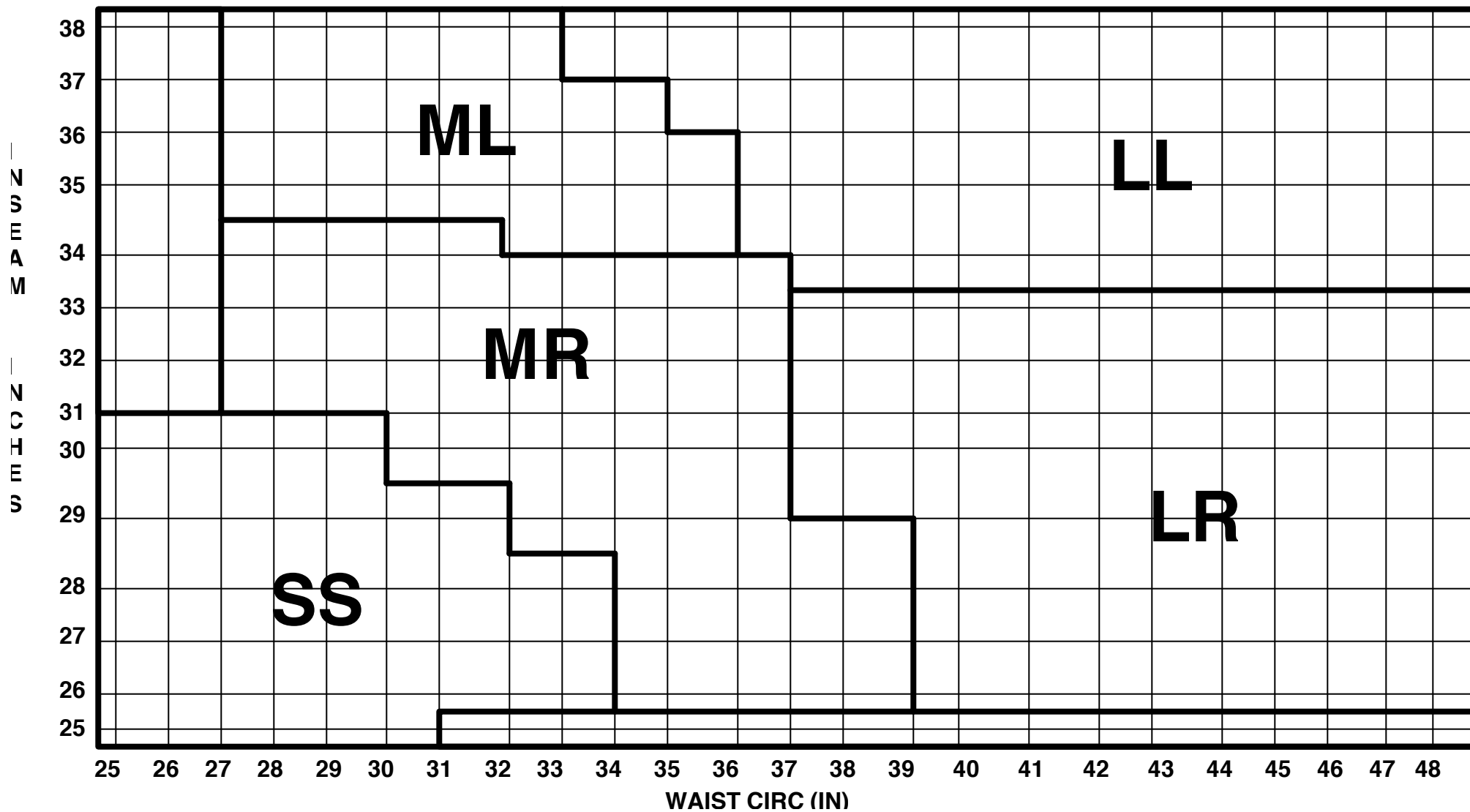
SIZE SS = Small Short

MS = Medium Short
MR = Medium Regular
ML = Medium Long

LR = Large Regular
LL = Large Long

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**FIGURE 8. JSLIST TROUSER SIZE SELECTION CHART
(Navy Only)**



SIZE **SXS** = Small Extra Short
 SS = Small Short

MS = Medium Short
MR = Medium Regular
ML = Medium Long

LR = Large Regular
LL = Large Long

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Appendix A – Laundering Instructions

Prior to chemical agent protection first article and production lot testing, launder the system six (6) times in accordance with the following:

<u>Step Number</u>	<u>Laundering Cycle</u>
1	Fill – warm water high level (90-110 ⁰ F)
2	*Wash 4-6 minutes with detergent
3	Drain
4	Fill – warm water high level (90-110 ⁰ F)
5	*Wash 2 minutes with detergent
6	drain
7	Fill – warm water high level (90-110 ⁰ F)
8	Rinse – 2 minutes
9	Drain
10	Fill – warm water high level (90-110 ⁰ F)
11	Rinse – 2 minutes
12	Drain
13	Fill – warm water high level (90-110 ⁰ F)
14	Rinse – 2 minutes
15	Drain
16	Extract – 3-5 minutes
17	**Dry – 120 ⁰ F max. Temperature

* Detergent conforming to Cosco Company NSN 7930-00-252-6797 (see paragraph 6.10 of Item Description) is required. For a 100-pound load, use 10 ounces fo detergent for step 2 and 6 ounces of detergent for step 5. Washing will conform to Milnor model #36026Q6P(see paragraph 6.11 of Item Description).

** Drying time for a 100-pound load is approximately 35-50 minutes.

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Appendix B

Sources of supply for packaging material and fabricating foil bags. It has been determined that the following suppliers are capable of meeting the foil film requirements:

Reynolds Metals Company
Flexible Packaging Division
6603 west Broad Street
Richmond, VA 23261
(804) 281-3947

Lakeland Packaging
219 Village Landing
Fairport, NY 14450-1805
(716) 425-3490

Laminated Films and Packaging
3560 Lafayette Road
Portsmouth, NH 03801
(603) 436-6374

American National Can
8770 West Brynmawr Avenue
Chicago, IL 60631
(773) 399-3000

Cadillac Products
5800 Crooks Road
Troy, MI 48098-2830
(810) 879-5036

Jefferson Smurfit Corp.
1228 East Tower Road
Schaumburg, IL 60173
(847) 781-3353

Pactech
110 Halstead Street
Rochester, NY 14610
(716) 288-5480

Flexseal International Packaging
24 Seneca Ave.
Rochester, NY 14621
1-800-872-7548

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7 and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:
1. DOCUMENT NUMBER
MIL-DTL-32102

2. DOCUMENT DATE (YYYYMMDD)
2002/04/03

3. DOCUMENT TITLE
JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY (JSLIST) COAT AND TROUSER, CHEMICAL PROTECTIVE
4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*
5. REASON FOR RECOMMENDATION
6. SUBMITTER
a. NAME *(Last, First, Middle Initial)*
b. ORGANIZATION
c. ADDRESS *(Include Zip Code)*
d. TELEPHONE *(Include Area Code)*
 (1) Commercial
 (2) DSN
(If applicable)
7. DATE SUBMITTED
(YYYYMMDD)

8. PREPARING ACTIVITY
a. NAME
DEFENSE SUPPLY CENTER PHILADELPHIA
DSCP-CNRP

b. TELEPHONE *(Include Area Code)*
 (1) Commercial (2) DSN
 (215) 737-3290 444-3290

c. ADDRESS *(Include Zip Code)*
700 Robbins Ave (Bldg 6, C&T)
PHILADELPHIA, PA 19111-5092

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 Defense Standardization Program Office (DLSC-LM)
 8725 John J. Kingman Road, Suite 2533
 Fort Belvoir, Virginia 22060-6221
 Telephone (703) 767-6888 DSN 427-6888

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