INCH-POUND

MIL-DTL-43976D
15 September, 2003

SUPERSEDING
MIL-G-43976C
5 September 1990

DETAILED SPECIFICATION

GLOVES AND GLOVE SET, CHEMICAL PROTECTIVE

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

1. SCOPE

*** 1.1 Scope.** This specification covers chemical protective rubber gloves and glove set in three different thicknessess. The type I glove set includes a pair of knitted cotton glove inserts. The gloves are special purpose Life Support Clothing and Equipment (LSC&E) items.

1.2 Classification. (see 6.2).

Type I - Glove Set (gloves with inserts), 25-mil rubber
Sizes - X-Small, Small, Medium, Large, X-Large

Type II - Gloves only, 14 –mil rubber
Sizes - Small, Medium, Large, X-Large

Type III - Gloves only, 7 –mil rubber
Sizes - Small, Medium, Large, X-Large

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.

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 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 this specification, 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 document 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 6.2).

SPECIFICATIONS

MILITARY

MIL-G-3866	- Gloves, Men's Cloth, Cotton, Knitted, Lightweight
MIL-D-12468	- Decontaminating Agent, STB

STANDARDS

FEDERAL

FED-STD-601	- Rubber: Sampling and Testing

MILITARY

MIL-STD-282	- Filter Units, Protective Clothing, Gas Mask Components and Related Products, Performance Test Methods

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Defense Automated Printing Service, Bldg. 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

*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

U.S. ARMY SOLDIER BIOLOGICAL AND CHEMICAL COMMAND

8-1-307	- Forms for Gloves, Chemical Protective

(Copies of drawings are available from the U. S. Army Biological and Chemical Command, ATTN: SSCNC-EMSS, NATICK, MA 01760-5017.)

FIELD MANUAL

U.S. ARMY CHEMICAL SCHOOL

FM 3-5, NBC DECONTAMINATION

(Copies of field manuals are available from the U. S. Army Chemical School, ATTN: ATZN-CM-NF, Fort, McClellan, Anniston, AL 36205-5020)

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 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM-D-297	- Rubber Product Chemical Analysis
ASTM-D-412	- Rubber Properties in Tension
ASTM-D-573	- Rubber-Deterioration in an Air Oven
ASTM-D-1053	- Stiffness, Torsional, Low-Temperature

(Applications for copies of referenced documents should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19426-2959.)

AMERICAN SOCIETY FOR QUALITY CONTROL

ANSI/ASQC Z1.4 Sampling Procedures And Tables For Inspection By Attributes

(Applications for copies should be addressed to ANSI/ASQC, American Society for Quality Control, 611 East Wisconsin Ave., Milwaukee, WI 53202.)

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

3. REQUIREMENTS

*3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.2 and 6.2).

*3.2 Samples. Samples, when furnished, are solely for guidance and information to the contractor (see 6.4). Variations from this specification may appear in the sample, in which case the specification shall govern.

*3.3 Material.

*3.3.1 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.

*3.3.2 Rubber compound. The gloves shall be made of butyl rubber, pigmented black, suitably compounded and vulcanized to meet the requirements of Table I when tested as specified in 4.4.5.

TABLE I – Vulcanized rubber glove requirements

Characteristic	Type I	Type II	Type III
Thickness, inch	0.025 1/	0.014 2/	0.007 3/
Tensile strength, p.s.i., (min):			
Original	1100	1100	1100
After aging	1000	1000	1000
After decontamination solution immersion	800	800	800
Tensile stress original at 200% Elongation, p.s.i	200 4/	200 4/	200 4/
Ultimate elongation, % (min)			
Original	400	400	400
After aging	350	350	350
After decontamination	300	300	300
Low temperature stiffening	5/	5/	6/
Deformation due to decontamination Solution, (max):			
After immersion, wet, % increase in thickness	10.0	10.0	10.0
After immersion, wet, % increase in length	7.5	7.5	7.5
After immersion and aeration, % increase in thickness	5.0	5.0	5.0
After immersion and aeration, % increase in length	5.0	5.0	5.0
Porosity	Pass 7/	Pass 7/	Pass 7/
Mustard resistance (break time in minutes), minimum	360	240	75
GB resistance (break time in minutes), minimum	450	450	360

1/ The thickness tolerance of all areas of the gloves, except the crotch areas, shall be –0.005, +0.007 inch. The thickness tolerance of the crotch areas shall be – 0.007 + 0.009 inch. The maximum thickness tolerance of +0.009 inch in a localized area is allowable when measured in accordance with 4.5.1.

2/ The thickness tolerance of all areas of the gloves, except the crotch areas, shall be –0.002, +0.007 inch. The thickness tolerance of the crotch areas shall be –0.001 +0.005 inch. The maximum thickness tolerance of +0.007 inch in a localized area is allowable when measured in accordance with 4.5.1.

3/ The thickness tolerance of all areas of the gloves, except the crotch areas, shall be –0.001, +0.003 inch. The thickness tolerance of the crotch areas shall be –0.001 +0.005 inch. The maximum thickness tolerance of +0.005 inch in a localized area is allowable when measured in accordance with 4.5.1.

4/ The tolerance shall be ± 125.

5/ The rubber specimens shall have an angular twist no less than the values shown below for the thickness indicated. Interpolation shall be used for any thickness not shown below. No angular twist shall exceed 180 degrees.

Thickness, inch	Twist, angular degree, minimum
0.012	180
0.020	155
0.025	138
0.030	119
0.35	99

6/ Not applicable to Type III gloves.

7/ There shall be no sign of porosity.

*3.4 Design and construction. The construction of the glove shall conform to drawing 8-1-307 (see 2.2). The gloves shall be five-finger style (see Figure 1), made on glove forms conforming to the dimensions shown on Drawing 8-1-307. The glove shall terminate in a cylindrical beaded edge around the gauntlet no greater than ¼ inch thick.

3.5 Color and finish. The color of the gloves shall be black with a dull, smooth finish.

3.6 Length and width. The length of all size gloves shall be 13-3/4 to 14-1/2 inches overall (see Figure 1, reference A), measured from the tip of the middle finger to the cuff edge. The width (see Figure 1, reference B) of the gloves shall be measured across the palm at the intersection with the thumb. The widths in inches (± 1/8 inch tolerance) shall be as follows:

X-Small	4-1/8
Small	4-5/16
Medium	4-1/2
Large	4-13/16
X-Large	5-1/8

All measurements shall be made with the gloves flat and unstretched.

*3.7 Identification marking. Each glove shall be permanently and legibly marked on the outside of the palm side in bold-faced Gothic capital letters of not less than ¼ inch in height with either yellow or white indelible marking ink (see 6.6). The marking shall be centered approximately 1-inch from the cuff edge with the following legend:

DO NOT USE FOR ELECTRICAL WORK OR FIRE FIGHTING

The backside of the glove shall be marked with the following information:

Stock number: 8415-00-000-0000 (Example)
Nomenclature: Gloves, Chemical Protective, Type II (Example)
Specification number: MIL-DTL-43976 (Example)
Size: Large (Example)
Contract number and date: SPO100-00-C-0000 01/01 (Example)
Contractor's name:
Date of manufacture (month and year): 02/01 (Example)

The marking shall remain legible when tested as specified in 4.4.5.

3.8 Instruction sheet. A paper instruction sheet shall be placed inside each pair of gloves. The size of the characters shall be ¼ inch (18 point) for headings and 1/8 inch (10 point) for instructions. The instruction sheet shall contain the information listed below:

GLOVES, CHEMICAL PROTECTIVE

GENERAL INSTRUCTIONS

a. These gloves are to be worn in the event chemical protection (CB protection) is required.

b. When wearing the gloves with Clothing Outfit, Chemical Protective, wear over the liner shirtsleeve and under outer shirt or coat.

c. When wearing gloves with Suit, Chemical Protective, wear under the sleeve of the coat.

d. For maximum durability and when working with sharp objects, wear leather gloves over the chemical protective gloves.

e. In the event the chemical protective gloves become contaminated, do not under any circumstances wear leather gloves over them.

f. In cold weather, wear environmental hand gear over these gloves.

g. Periodically inspect the chemical protective gloves for holes or punctures. In the event they do develop holes, are punctured, or become torn, discard immediately and use a serviceable pair.

h. With proper care, the gloves are capable of providing protection for at least 14 days of continuous wear.

i. Wear cotton gloves under your chemical protective gloves to assist in the absorption of moisture to retain comfort.

DECONTAMINATION OF GLOVES

a. Gloves exposed to toxicological agents must be decontaminated before reuse. The gloves can be decontaminated by using the procedures specified in FM 3-5, NBC Decontamination.

b. Should your gloves become contaminated with gasoline, oil, grease or cleaning fluids, wipe-off and air dry within 2 minutes. If gloves cannot be wiped off and air-dried within 2 minutes they should be replaced at the earliest possible time.

3.9 Dusting. The inside and outside of each finished glove shall be lightly dusted with whiting, talc, or other finely divided non-toxic mineral matter which does not support mildew growth. Gloves tested for porosity shall be thoroughly dried and redusted.

3.10 Put-up (Type I only). One pair of cloth cotton knitted glove inserts conforming to type II of MIL-G-3866 shall be unit packed with each pair of type I chemical protective gloves (see 5,1,1). The small size cloth gloves shall be unit packed with the x-small and small size chemical protective gloves. The medium size cloth gloves shall be unit packed with the medium, large and x-large size chemical protective gloves.

*3.11 Certificates of compliance. When certificates of compliance are submitted, the government reserves the right to inspect such items to determine the validity of the certification.

3.12 Workmanship. The finished chemical protective gloves and glove sets shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels. Utmost care shall be taken during component and subassembly fabrication to ensure quality workmanship and safety of the service person using the item.

4. VERIFICATION

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).
b. Conformance inspection (see 4.4).

4.3 First article inspection. When a first article is required (see 3.1 and 6.2) it shall be examined as specified herein. Preproduction samples of the gloves produced from the forms or molds which the contractor intends to use for production of the item shall be furnished to the contracting officer for approval of design and to determine that the forms or molds conform to the dimensions shown on Drawing 8-1-307.

*4.3.1 Type I and II. Type I and II first article units shall be examined for the defects as specified in 4.4.2, 4.4.3, and 4.4.4 and subjected to the tests as specified in Table III. The presence of any defect or failure of any test shall be cause for rejection of the first article.

*4.3.2 Type III. Prior to commencing first article testing, each type III first article unit shall be subjected to the porosity test as specified in 4.5.2. Any glove found to leak shall be rejected. For first article inspection, type III first article units that successfully pass porosity testing shall be examined for the defects as specified in 4.4.2, 4.4.3, and 4.4.4 and subjected to the remaining tests as specified in Table III. The presence of any defect or failure of any of the remaining tests shall be cause for rejection of the first article.

*4.4 Conformance inspection. Unless otherwise specified, sampling for inspection shall be in accordance with the provisions of ANSI/ASQC Z1.4.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

4.4.1.1 Component and material certification. A certificate of compliance may be acceptable as evidence that the gloves were made on forms or molds conforming to the requirements of 3.4.

*4.4.1.2 Lot size. The maximum lot size submitted for government acceptance shall be 10,000 gloves or 5,000 pairs of gloves. Each lot submitted must be of the same type. Type I gloves may not be mixed with Type II or Type III gloves and Type II gloves may not be mixed with Type III gloves.

*4.4.2 End item critical visual defect examination. Prior to performing the end item sampling examination in accordance with 4.4.3, 100% of the gloves shall be examined for the critical defects listed in Table II. This 100% examination for critical defects shall become a part of the contractor's inspection system or quality assurance program. Any glove found to contain one or more critical defects shall be rejected.

*4.4.3 End item visual examination. The end item shall be examined for the defects listed in Table II. The sample unit shall be one glove and the selection shall be by pairs. Defects for pairing shall be classified as a single defect. The inspection level shall be II. The finding of one or more critical defects shall be cause for rejection of the lot.

TABLE II. End item visual defects

Examine	Defect	Classification Critical	Major	Minor
Pairing	Mispaired, i.e., two gloves of different sizes, or two gloves for the same hand			101
	Definite variation in color or appearance		201	
Design	Any characteristic not in accordance with specified requirements			102
Color and Finish	Not black		202	
	Not dull, smooth finish		203	
Construction & workmanship (applicable to inside & outside of glove	Any cut, tear, hole, rip or rupture through material	1		
	Any closed blister	2		
	Any burned spot which cracks on flexing, bending or stretching (by hand)	3		
	Any pinch, pit, thin spot, abraded area, deep crease, readily removable foreign matter (see note) or similar defective condition which results in a thickness at the defect less than the minimum thickness allowed for the glove	4		
	Any 1 square inch area which contains more than three pinches, pits, thin spots, abraded areas, deep creases, readily removable foreign matter (see note) or similar defective condition not resulting in a thickness at the defect less than the minimum thickness allowed for the glove		204	
	Any foreign matter not readily removable in an area beyond 4 inches from the cuff edge.		205	
	Any foreign matter larger than 1/32 inch across, not readily removable in area within 4 inches of cuff edge		206	

TABLE II. End item visual defects (continued)

Examine	Defect	Classification Critical	Major	Minor
	NOTE: Readily removable foreign matter is defined as material that can be removed by flexing or stretching the glove by hand or by rubbing the defective area with the ball of the thumb or fingers. Cutting, scratching or otherwise puncturing the surface is not permitted.			
	Any repair or patch	5		
	Any solid rubber ridge, run or lump resulting in a thickness greater than the maximum thickness of the rubber allowed for the glove when measured in accordance with 4.5.1.		207	
	Tackiness after dusting (see 3.9)	6		
	Any malformation or distortion			103
	Not clean, i.e., dirty but can be cleaned with a non-petroleum based cleaning agent		208	
	Not clean, i.e., dirty but cannot be cleaned with a non-petroleum based cleaning agent			104
	Inside and outside of glove not dusted			105
Marking identification and instruction sheet	Not permanent, i.e., can be easily rubbed off with moistened thumb		209	
	Not in specified location, characters not height specified, not specified color or not accomplished as specified		210	
	Omitted or illegible			106
	Missing, incomplete or incorrect			107

*4.4.4 End item dimensional examination. The gloves shall be examined for conformance to the dimensions specified in 3.6. Any dimension that is not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of one glove. The sample unit shall be one glove and the selection shall be by pairs. The inspection level shall be as specified in the contract.

*4.4.5 End item testing. The gloves shall be tested for the characteristics shown in Table III. The lot size shall be expressed in units of one glove. The sample unit shall be one glove and the selection shall be by pairs. All requirements shall be applicable to the sample unit. When the data in the "Number of determinations per sample unit" and "Results reported as" columns are not specified in Table III, they shall be as required by the referenced test method. All test reports shall contain the individual values used in expressing the final results. The sample unit for all tests other than porosity and Government acceptance tests shall be 9 pairs of gloves. The sample size shall be as specified below. One or more sample units failing to meet any specified requirement shall be cause for rejection of the lot.

Lot size	Number of sample units
800 or less	2 x (9 pairs) = 18 pairs
801 up to and including 22,000	3 x (9 pairs) = 27 pairs
22,001 and over	5 x (9 pairs) = 45 pairs

*4.4.5.1 Porosity test.

4.4.5.1.1 Contractor testing. Prior to the selection of samples for end item verification testing, the contractor shall test for porosity in accordance with 4.5.2. For Type I and Type II gloves the lot size shall be expressed in units of one glove. The sample unit shall be one glove and the sample size shall be by pairs. Each glove of the pair shall be tested for porosity. The table below shall be used to determine the sample size for porosity testing. The sample size was generated in accordance with ANSI/ASQ Z1.4, general inspection level II, Normal Inspection (Tables 1 and II_A). Any Type I or Type II glove found to leak shall be cause for rejection of the lot represented by the sample. For Type III gloves, each glove shall be tested for porosity. Any glove found to leak shall be rejected.

Lot size (units of one glove)	Number of sample units
8 or less	2 gloves
9 to 15	3 gloves
16 to 25	5 gloves
26 to 50	8 gloves
51 to 90	13 gloves
91 to 150	20 gloves
151 to 280	32 gloves
281 to 500	50 gloves
501 to 1,200	80 gloves
1,201 to 3,200	125 gloves
3,201 to 10,000	200 gloves

*4.4.5.1.2 End item verification testing, porosity (Types I, II and III). For all glove types the lot size shall be expressed in units of one glove. The sample unit shall be one glove and the sample size shall be by pairs. Each glove of the pair shall be tested for porosity. The table below shall be used to determine the sample size for porosity testing. The sample size was generated in accordance with ANSI/ASQ Z1.4, General Inspection Level II, Normal Inspection (Tables I and II-A). Any glove found to leak shall be cause for rejection of the lot represented by the sample.

Lot size (units of one glove)	Number of sample units
8 or less	2 gloves
9 to 15	3 gloves
16 to 25	5 gloves
26 to 50	8 gloves
51 to 90	13 gloves
91 to 150	20 gloves
151 to 280	32 gloves
281 to 500	50 gloves
501 to 1,200	80 gloves
1,201 to 3,200	125 gloves
3,201 to 10,000	200 gloves

*4.4.5.2 Government acceptance tests (see 6.7). The Government shall perform acceptance tests for sulfur mustard (HD) resistance and sarin (GB) resistance. The sample unit shall be two pairs of gloves and the inspection level shall be S-2. The table below shall be used to determine the sample size. These tests are considered critical and any failure shall be cause for rejection of the lot represented by the sample.

Lot size (units of one glove)	Number of sample units
25 or less	2 x (2 pairs) = 4 pairs
26 to 150	3x (2 pairs) = 6 pairs
151 to 1,200	5x (2 pairs) = 10 pairs
1201 to 35,000	8x (2 pairs) = 16 pairs
35,001 to 150,000	13x (2 pairs) = 26 pairs

TABLE III. End item tests

Characteristic	Requirement	Test Method	# determinations/sample unit	Results reported as Pass or Fail	Results reported as Numerically to nearest
Material Identification (rubber)	3.3.1	D 297 1/ 2/	1	X	-
Thickness	Table I	4.5.1	-	-	-
Porosity	Table I	4.5.2	1	X	-
Tensile strength:					
Original	Table I	D 412 2/ 3/	-	-	-
After aging	Table I	D 412 2/ 3/ 4/	-	-	-
After decontamination solution immersion	Table I	4.5.5	-	-	-
Tensile stress at 200% elongation	Table I	D 412 2/ 3/	-	-	-
Ultimate elongation:					
Original	Table I	D 412 2/ 3/	-	-	-
After aging	Table I	D 412 2/ 3/ 4/	-	-	-
After decontamination solution immersion	Table I	4.5.5	-	-	-
Low temperature stiffness	Table I	4.5.3	-	-	whole degree
Deformation due to decontamination solution:					
After immersion wet:					
Thickness	Table I	4.5.4	-	-	0.1%
Length	Table I	4.5.4	-	-	0.1%
After immersion and aeration:					
Thickness	Table I	4.5.4	-	-	0.1%
Length	Table I	4.5.4	-	-	0.1%
Permanence of marking	3.7	4.5.6	1	X	-
Mustard resistance	Table I	209 5/	2	-	1 minute
GB resistance	Table I	208 5/	2	-	1 minute

1/ Only the pyrolysis test shall be used.
2/ Refers to ASTM test method.

3/ Three gloves shall be selected from each sample unit and one specimen shall be tested from each glove selected. Method A of the test shall be used.
4/ The specimen shall be aged at 212°F for 48 hours in accordance with ASTM Method D 573 before being tested for tensile strength and elongation.
5/ Refers to test method in MIL-STD-282.

*4.4.6 Packaging examination. The fully packaged end items shall be examined for marking, materials, workmanship and content defects.

4.5 Methods of inspection.

*4.5.1 Thickness test. Thickness of the gloves shall be in determined in accordance with Method 2011 of FED-STD-601. Three gloves from each sample unit shall be tested. Five measurements shall be made on each of the three gloves in an area of not less than 1 inch nor more than 5 inches from the cuff edge. The crotches of the gloves shall also be measured for thickness. The sample unit shall fail if any single measurement is less than the minimum specified. If any measurement is greater than the maximum specified, determine the size of the area that is over the maximum thickness. If it is greater than one inch in diameter, the sample unit shall fail. If it is less than one inch in diameter and equal to the maximum thickness allowable for a localized area, the sample unit shall pass. If it is less than one inch in diameter and greater than the maximum thickness allowable for a localized area, the sample unit shall fail.

*4.5.2 Porosity.

*4.5.2.1 Test apparatus. The test apparatus shall be of a mechanism as described herein or any other similar type in principle, provided the results can be obtained as specified in 4.5.2.2. A hollow wooden shank, 3 inches in length, tapered on the outer surface to fit the open end of a rubber glove and a steel ring tapered on the inner surface to fit over the wooden shank shall be used. The shank shall be attached to a steel base plate to make an airtight joint, and the tapered ring shall be bolted to the base plate so that it can be tightened over the shank. The brass nipple shall be connected with the other pipe fittings to mount a tire inflation valve, an air pressure gauge and a pressure release valve. The assembled apparatus shall be as shown in Figure 2.

*4.5.2.2 Procedure. The cuff of the glove shall be pulled over the shank of the test apparatus and clamped firmly in place by tightening the steel ring against the base plate. Compressed air shall be fed into the glove to a pressure of 0.5 pound per square inch for types I and II gloves and 0.25 pound per square inch for type III gloves. The inflated glove shall be immersed in the water for stages, for observation of porosity as indicated by air bubbles. The inflated gloves shall be immersed into the water cuff or fingers first in three stages. Initially the glove shall be immersed so that about 1/3 of the glove is under water. The glove will be care fully observed for air bubbles. If no air bubbles are seen the glove shall be lowered until 2/3 of the glove is under water. Again, carefully observe the area under water for air bubbles. If no air bubbles are observed the remainder of the glove shall be immersed so that the tip of the middle finger or cuff bead is less than 1 inch below the water line. Carefully observe the glove for air bubbles. No visible bubbling shall be permitted during the test. At no time should the area of the glove being observed for air bubbles be further than 6 inches below the surface of the water. The pressure exerted by the water below this 6-inch depth can be great enough to prevent the release of air bubbles from a small hole or tear.

NOTE: During porosity testing involving the types II and III gloves, it may become necessary to assist in immersing the gloves by supporting them with the manipulating hand.

4.5.3 Low temperature stiffness test. Low temperature stiffness shall be determined in accordance with ASTM D 1053, paragraph entitled "Routine Inspection and Acceptance" with the following exceptions:

a. The test shall be conducted at –40°F
b. The liquid coolant shall be methyl alcohol.
c. The exposure time shall be 5 minutes.
d. The black wire having a torsional constant of 0.125 gf. cm/degree shall be used instead of the standard wire.
e. The angular degree of twist shall be in accordance with 3.3.1.

4.5.4 Deformation due to decontamination solution test. Three gloves from each sample unit shall be tested. The resistance to decontamination solution shall be determined as follows:

a. Accurately mark a 3 by 6 inch area on each glove. Draw three straight lines along the entire length of the area as follows: The first line shall be ½ inch in from one edge of the marked area, the second line ½ inch in from the opposite edge. The third line shall be 1-1/2 inches from both edges. Then draw three straight lines across the entire width of the area as follows: The first line shall be 2 inches in from one edge of the marked area, the second line 2 inches in from the opposite edge. The third line shall be 3 inches from both edges. Using a micrometer as described in Method 2011 of FED-STD-601, determine the thickness of the area at the nine points where the three length lines cross the three width lines. The thickness shall be the average of the nine values.

b. Mount the glove on a suitable form and immerse in test solution to within 1 inch of the cuff edge, taking care not to wet the interior. The test solution shall be a super-tropical bleach (STB) slurry. The slurry shall be made up (by weight) of 1 part super-tropical bleach conforming to MIL-D-12468 and 2 parts water. (Note: Super-tropical bleach is corrosive to most metals and is injurious to most fabrics. A protective mask and gloves should be worn when handling this material.) The temperature of the slurry during the test shall be 80° to 90° F. The time of immersion shall be 5 minutes.

c. After the 5 minute immersion in STB solution, withdraw the glove, wash off the slurry with water, then rinse in 95% ethyl alcohol and, while the glove is still wet, measure the marked area immediately for thickness and length. Thickness shall be determined as described in "a" above. The length shall be measured along the three length lines and the length recorded as the average of the three measurements.

d. Place the wet gloves on heavily talked paper towels and allow to stand at room temperature for 18 hours.

e. After the 18 hours air-drying, remeasure the marked area for thickness and length. Determine thickness in accordance with "a" above and length in accordance with "c" above.

f. The percent increase in thickness and percent increase in length shall be calculated as follows:

$$\%\ \text{increase in thickness after immersion (wet)} = \frac{T1-T}{T} \times 100$$

$$\%\ \text{increase in thickness after immersion \& aeration} = \frac{T2-T}{T} \times 100$$

$$\% \text{ increase in length after immersion (wet)} = \frac{L1-L}{L} \times 100$$

$$\% \text{ increase in length after immersion and aeration} = \frac{L2-L}{L} \times 100$$

Where:

T = Original thickness as determined in "a".
T1 = Thickness after immersion as determined in "c".
T2 = Thickness after immersion and aeration as determined in "e".
L = Original length (6 inches)
L1 = Length after immersion as determined in "c".
L2 = Length after immersion and aeration as determined in "e".

4.5.5 Tensile strength and ultimate elongation after decontamination test. The tensile strength shall be determined in accordance with ASTM D 412 (method A). The cross sectional area of the specimen shall be calculated using the thickness determined in 4.5.4a. The ultimate elongation shall be determined in accordance with ASTM D 412 (method A). One specimen shall be cut from each glove that was tested for decontamination. The specimens shall be cut from the 3 by 6 inch area marked on the gloves. The long dimension of the specimen shall be parallel to the long dimension of the 3 by 6 inch area. The specimens shall be cut in such a manner that the ends of the specimen are equidistant from the adjacent 3-inch long edges of the marked area.

4.5.6 Permanence of marking test. The gloves shall be tested to determine the durability of the marking as follows:

a. Boil gloves for 2-1/2 to 3 hours in a solution containing 1.25 oz/gal of standard calcium hypochlorite bleach powder (70% available chlorine).

b. Remove gloves from the bleach solution and soak in fresh water at 70°F for 15 minutes. Change water and repeat this step two additional times.

c. Hang the gloves and allow them to dry at about 110°F. When the gloves are dry, examine them for legibility of markings.

5. PACKAGING

*5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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.

6. NOTES

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

*6.1 Intended use. The Type I glove sets and types II and III gloves are intended for use with other Chemical Protective Clothing (coats, trousers and underwear). The gloves provide protection from hazardous chemicals when worn with chemical protective suits and outfits.

*6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Special provisions for verification inspection of Life Support Clothing and Equipment (see 1.1).
c. Type and size required (see 1.2).
d. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
e. When first article is required (see 3.1, 4.2 and 6.3).
f. Levels of preservation and packing (see 5.1).

*6.3 First article. When a first article is required, it should be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection and approval of the first article.

6.4 Sample. For access to standard sample, address the contracting activity issuing the invitation for bids.

*6.5 Glove forms. Blocks and casings for the glove forms used in the dipping process are Government owned and are stored at the General Porcelain Manufacturing Company. Inc., Justrite Ceramics Division, 951 Pennsylvania Avenue, Trenton, NJ 08638, (609)-396-7588. Forms for the gloves may be purchased from this company.

*6.6 Marking ink. Markem JXN-7410-H-White or Yellow, made by Markem Corporation, P.O. Box 2100, Keene, NH 03431 (603)-352-1130, has been found to be suitable when dried under infrared light for 24 hours.

*6.7 Government acceptance tests (see 4.4.5.2) Direct all government acceptance tests to:

Battelle Labs
1425 State Route 142 JST-1
West Jefferson, OH 43162

* 6.8 Surveillance program. Items to be set aside for surveillance (twelve (12) pairs of gloves of each type per lot) should be shipped separately to the address below:

Traffic Management Officer
MCLB Bldg. 1221 Dr 20
Special Projects
MFM98500 MCSP WHSE 1241 Dr 12
Albany, GA 31704-5000
Attn: Project Code R4J

6.9 Subject term (key word) listing.
Butyl
Handwear
Hazardous chemicals
Life Support Clothing & Equipment (LSC&E)
Rubber

*6.10 Changes from previous issue. The margins of this document have been marked with an asterisk(*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army - GL
Navy – NU
Air Force - 11

Review activities:
Army – MD, EA
Navy – MC, SH

Preparing activity
DLA-CT

Project No: 8415-0241

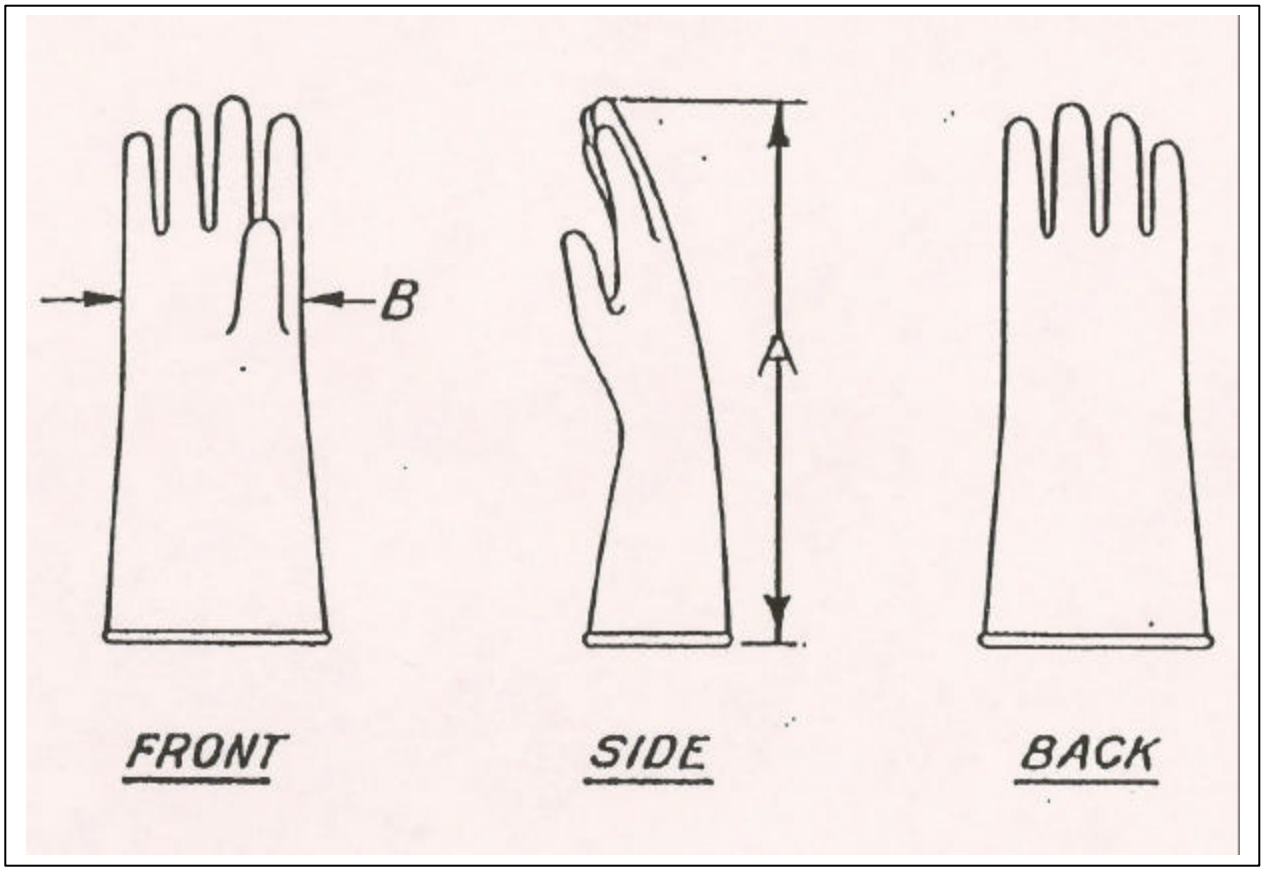

Figure 1 – Gloves, Chemical Protective

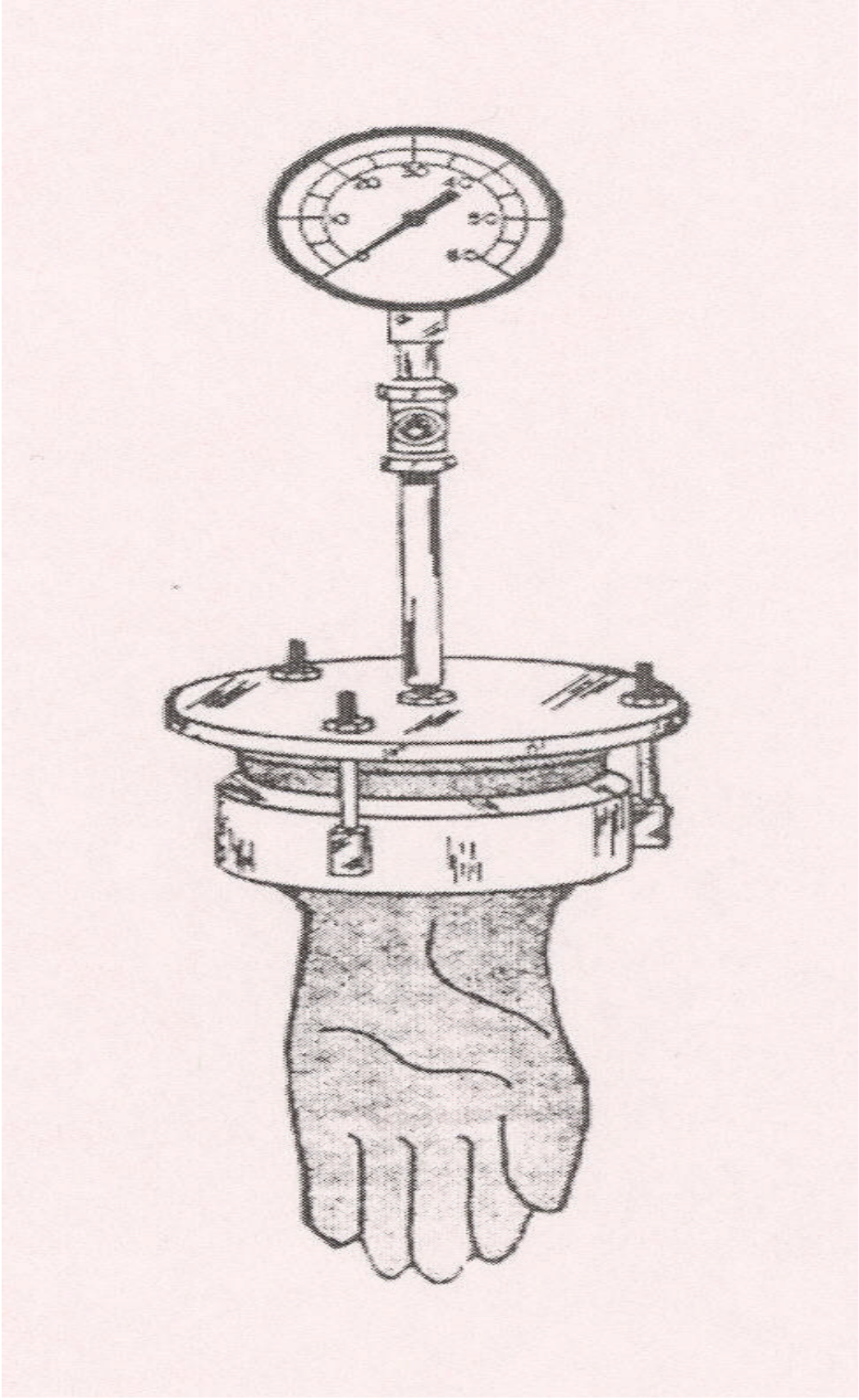

Figure 2 – Porosity test apparatus

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.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER** MIL-DTL-43976D	**2. DOCUMENT DATE** ***(YYYYMMDD)*** 2003/09/15

3. DOCUMENT TITLE

Gloves and Glove set, 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	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** 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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WHS/DIOR, Feb 99