

INCH-POUND

A-A-59826

03 March 2009

SUPERSEDING

V-T-295E

1 August 1985

COMMERCIAL ITEM DESCRIPTION

THREAD, NYLON

The General Services Administration has authorized the use of this commercial item description as a replacement for V-T-295 for all federal agencies.

1. **SCOPE.** This commercial item description covers nylon thread used for machine and hand-sewing.

2. **CLASSIFICATION.** The thread shall be of the following Types and Classes. In end item documents where neither Class designation "A" or "B" is indicated, the requirements for Class "A" shall apply.

- 2.1 **Type.**
- | | |
|----------|---|
| Type I | - Twisted multiple cord, unbonded, soft finish |
| Type II | - Twisted multiple cord, bonded finish |
| Type III | - Monocord, bonded finish |
| Type IV | - Hand-sewing twist, waxed finish |
| Type V | - Buttonhole twist, hand-sewing (waxed) |
| Type VI | - Tailoring, twisted multiple cord, soft finish |
| Type VII | - Quilting thread, coreless cocoon bobbins and top thread, twisted multiple cord, soft finish |

- 2.2 **Class.**
- | | |
|---------|------------------------------|
| Class A | - General purpose |
| Class B | - Non-wicking (Type I or II) |

3. **SALIENT CHARACTERISTICS.** The thread shall be bright, high tenacity continuous multifilament nylon. The nylon shall be a polyamide prepared from hexamethylene diamine and adipic acid or its derivatives. The thread shall have a melting point of not less than 472°F and conform to the applicable requirements specified in Tables I through X. Types II and III threads shall be bonded with a colorless nylon polymer agent.

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP Standardization Team, 700 Robbins Avenue, Philadelphia, PA 19111-5096. Since contact information can change, you may want to verify the currency of the address information using Acquisition Streamlining and Standardization Information System (ASSIST) online database at http://assist.daps.dla.mil .
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3.1 Twist direction. Unless otherwise specified, the direction of the final twist shall be "Z" except that number sizes of Types I, II and VII threads when used for sole stitching of footwear, or coreless bobbins and top threads for quilting may be "S" or "Z". The final twist of Type IV shall be "S".

3.2 Physical characteristics. The finished thread shall conform to the applicable requirements for the specified Type, Tex no. (*Approximate size. True Tex size is measurement of gram weight of 1000 meters of finished thread), within the stated approximate ranges below and Government size (letter or number) set forth in Tables I through Table VII when tested as specified in Table VIII.

3.2.1 Type I thread. The Type I thread shall be unbonded, plied thread with each individual yarn having an initial twist in the opposite direction to the final twist, and the initial twist shall meet or exceed the final twist per inch "TPI" and shall conform the physical characteristics specified in Table I when tested as specified in Table VIII.

TABLE I. Physical characteristics of Type I – (Twisted multiple cord, soft finish),

Tex No. (g/km)	Government Letter size	Ply	Final twist TPI (min.)	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
				min.	max.		
16-17	00	2	12.0	25,801	31,000	1.8	26
21-23	A	3	10.0	18,001	25,800	2.8	26
30-32	AA	2 or 3	9.0	13,001	18,000	4.1	26
45-46	B	2 or 3	7.0	8,701	13,000	6.0	26
68-70	E	3	6.0	5,801	8,700	9.0	26
90-101	F	3 or 4	5.5	4,001	5,800	11.8	26
135-144	FF	3	5.0	2,901	4,000	17.5	35
	Government Number size						
205-210	3	3	4.5	1,951	2,900	27.0	35
270-292	4	3	4.0	1,451	1,950	36.0	35
350-381	5	3	3.5	1,151	1,450	45.0	35
400-472	6	3	3.0	951	1,150	54.0	35
600-601	8	3	2.5	701	950	72.0	35

3.2.2 Type II thread. The Type II thread shall be a bonded, plied thread with each individual yarn having an initial twist in the opposite direction to the final twist, and the initial twist shall meet or exceed the final "TPI" and shall conform the physical characteristics specified in Table II when tested as specified in Table VIII.

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TABLE II. Physical characteristics of Type II – (Twisted multiple cord, bonded finish)

Tex No., (g/km)	Government Letter size	Ply	Final twist TPI (min.)	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
				min.	max.		
16-19	00	2	12.0	23,201	29,000	1.8	26
21-25	A	3	10.0	16,201	23,200	2.8	26
30-36	AA	2 or 3	9.0	11,701	16,200	4.1	26
45-51	B	2 or 3	7.0	7,801	11,700	6.0	26
70-76	E	3	6.0	5,201	7,800	9.0	26
90-112	F	3 or 4	5.5	3,601	5,200	11.8	26
135-160	FF	3	5.0	2,601	3,600	17.5	35
210-268	3	3	4.5	1,751	2,600	27.0	35
270-325	4	3	4.0	1,301	1,750	36.0	35
350-426	5	3	3.5	1,051	1,300	45.0	35
400-526	6	3	3.0	851	1,050	54.0	35
600-684	8	3	2.5	600	850	72.0	35

3.2.3 Type III thread. The Type III thread shall be a single ply construction, consisting of a minimum of 17 filaments bonded together to form a smooth even monochord and the twist shall be no more than 4 “TPI” and shall conform the physical characteristics specified in Table III when tested as specified in Table VIII.

TABLE III. Physical characteristics of Type III - (Monocord, bonded finish)

Tex No., (g/km)	Government Letter size	Ply	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
			min.	max		
16-20	00	1	23,901	27,000	1.8	35
21-25	A	1	16,351	23,900	2.8	35
27-34	AA	1	13,301	16,350	4.1	35
45-47	B	1	8,001	13,300	6.0	35
70-75	E	1	5,201	8,000	9.0	35
90-110	F	1	3,851	5,200	11.8	35
135-154	FF	1	2,151	3,850	17.5	35
	Government Number size					
150-258	3	1	1,701	2,150	27.0	35
270-331	4	1	1,301	1,700	36.0	35
350-431	5	1	1,001	1,300	45.0	35
400-536	6	1	851	1,000	54.0	35
600-684	8	1	600	850	72.0	35

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3.2.4 Type IV thread. The Type IV thread shall be twisted, two-cord (ply) construction, unbonded with a wax finish. Each of the individual yarns shall have an initial twist which meets or exceeds the final “TPI”. The final twist shall be "s" and the thread shall be suitable for simulated hand-sewing and shall conform the physical characteristics specified in Table IV when tested as specified in Table VIII.

TABLE IV. Physical characteristics of Type IV - (Hand sewing twist, wax finish)

Tex No., (g/km)	Government Letter size	Ply	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
			min.	max		
35-36	A	2	13,001	14,600	3.5	35
45	C	2	8,901	13,000	5.7	35

3.2.5 Type V thread. The Type V thread shall be of a twisted, three-cord (ply) construction, unbonded with a wax finish. Each individual ply shall have an initial twist in the opposite direction to the final twist, and the initial twist shall meet or exceed the final “TPI”. The final plied twist shall be suitable for hand sewing and shall conform the physical characteristics specified in Table V when tested as specified in Table VIII.

Table V. Physical characteristics of Type V-(Buttonhole twist, hand sewing, waxed)

Tex No., (g/km)	Government Number size	Ply	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
			min.	max.		
180-191	6	3	2,321	2,920	20.0	35
150-160	8	3	2,921	3,310	16.0	35
132-135	10	3	3,311	4,180	14.0	35

3.2.6 Type VI thread. The Type VI thread shall be multiple cord (ply) construction, soft finish. Each of the individual plies shall have an initial twist in the opposite direction to the final twist, and the initial twist shall meet or exceed the final “TPI”. The final plied twist shall be suitable for machine sewing and shall conform the physical characteristics specified in Table VI when tested as specified in Table VIII.

TABLE VI. Physical characteristics of Type VI- (Tailoring, twisted multiple cord, soft finish)

Tex No., (g/km)	Government Letter size	Ply	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
			min.	max.		
24	0	2 or 3	16,000	25,000	2.8	35
40	B	2 or 3	11,001	14,000	4.1	35
90-97	F	3	4,201	6,000	11.0	35

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3.2.7 Type VII thread. The Type VII thread shall be multiple cord (ply) construction. Each of the individual plies shall have an initial twist in the opposite direction to the final twist, and the initial twist shall meet or exceed the final “TPI”. The final plied twist shall be suitable for multi-needle quilting machines and shall conform the physical characteristics specified in Table VII when tested as specified in Table VIII.

TABLE VII. Physical characteristics of Type VII- (Quilting thread, coreless cocoon bobbins and top thread, twisted multiple cord, soft finish)

Tex No., (g/km)	Government Letter size	Ply	Final twist TPI (min.)	Length per pound (yards)		Breaking strength, lbs. (min.)	Elongation, % (max.)
				min.	max.		
18	00	2	12.0	24,781	33,040	1.8	33
24-27	A	3	10.0	16,521	24,780	2.8	33
35	AA	3	9.0	12,391	16,520	4.1	33
50	B	2	7.0	8,851	12,390	6.0	33

3.3 End item examination. The threads for all Types shall conform to the physical characteristics specified in Tables I, II, III, IV, V, VI, and VII, when tested in accordance with the test methods listed in Table VIII.

TABLE VIII. Physical characteristics and end item tests

Characteristic	Requirement Paragraph, Reference & Ratings	Test method
Fiber identification Nylon	Paragraph - 3.0	ASTM D 276 or AATCC-20, <u>1/</u>
Melting point 472°F (min)	Paragraph - 3.0	ASTM D 276 or AATCC-20, <u>1/</u>
Bright, continuous multifilament	Paragraph -3.0	Visual
Direction of twist-(Initial and final)	Paragraph -3.1	ASTM D 204
Tex Size	Paragraph -3.2	ASTM D 3823
Twist (TPI) Individual and final	Paragraph -3.2	ASTM D 204
Number of plies	Paragraph -3.2	Visual
Length per pound	Paragraph -3.2	ASTM D 1907
Breaking strength	Paragraph -3.2	ASTM D 204, <u>2/</u>
Elongation	Paragraph -3.2	ASTM D 204, <u>2/</u>
Colorfastness (as applicable)	Paragraph -3.5	ASTM D 204
Laundrying (after 3 cycles)	3-4	AATCC 61, Procedure 1A, <u>2/</u> , <u>3/</u> <u>4/</u> <u>5/</u>
Light (after 40 hrs. or 170kJ)	3-4	AATCC-16 Opt 3, <u>6/</u>
Wet dry-cleaning	3-4	AATCC 132 <u>5/</u>
Perspiration	3-4	AATCC-15, <u>5/</u>
Weathering (after 80 hrs. or 340kJ)	3-4	AATCC-169 Opt 1, <u>6/</u>

1/ In case of dispute, the ASTM method prevails

2/ Except that five determinations shall be made per sample unit.

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3/ The specimens shall be dried after each of the 3 laundering cycles.

4/ The color transfer cloth evaluation shall not apply. No appreciable change in shade or loss of color of the tested specimen shall be visible when compared to the untested thread retained.

5/ Rated using the AATCC Evaluation Procedure 1, Gray Scale for Color Change and Procedure 2, Gray Scale for Staining.

6/ Rated using the AATCC Evaluation Procedure 1, Gray Scale for Color

3.4 Knots. Thread size FF for all Tex sizes, and finer shall average not more than one thread knot per 2 ounces, and thread size 3 for all Tex sizes and heavier shall average not more than one thread-knot per 4 ounces. The thread shall average not more than one full thread knot or splice per 1,000 yards.

3.5 Color. The color shall be as specified in the applicable end item specification or in the contract or purchase order. The dyed thread shall conform to the applicable approved shade standard. Colorfastness requirements for the thread are to be specified in keeping with requirements for the basic material and end items using industry guidelines (see 7.7) and in accordance with the colorfastness requirements specified in Table VIII.

3.6 Finish removal procedure. Before evaluation for shade matching and testing for colorfastness, except for colorfastness to wet dry cleaning, the thread shall be wet dry cleaned in accordance with AATCC-132. Excess solvent shall be removed by centrifuging or wringing. The sample shall then be rinsed in distilled water at 120°F to 160°F and dried at a temperature not exceeding 180°F. The dried sample shall then be conditioned for a minimum of 4 hours prior to evaluation for shade matching or colorfastness.

3.7 Visual shade matching. The color and appearance of the finished thread, after removal of finish (see 3.6), shall match the standard sample when viewed using AATCC Evaluation Procedure 9, Option A, with sources simulating artificial daylight D75 illuminant with a 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 $2856 \pm 200^\circ\text{K}$.

3.8 Finishing materials. The finished thread shall have no chemical finishes or treatments other than those commonly used, i.e. water-repellent, etc, on commercial threads which have been demonstrated to have no deleterious effects on the fiber, including effects of prolonged storage. No finish or treatment shall be applied for the purpose of increasing breaking strength. There shall be no noticeable wicking of the treatment on the thread to adjacent material when sewn. Appropriate finishes shall be applied for bonding (Types II and III), and waxing (Types IV and V). Types IV and V thread shall be waxed so that the thread shall have a smooth, dressed surface suitable for hand-sewing. Class B thread shall have an approved (see 7.5.1.1) non-wicking finish (see 3.8.1).

3.8.1 Non-wicking (Class B). The finished treated thread for Class B shall be tested for water repellency in accordance with the vertical rise non-wicking procedure in either initial state or accelerated laundered per end-item requirements. The Class B thread shall resist the wicking of water for a period of not less than 6 hours when tested as specified in 3.8.1.1. For end-items requiring accelerated laundering resistance, thread shall resist wicking of water for a period of not less than 6 hours after 3 Launder-Ometer laundering cycles as specified in 3.8.1.2. The use of compounds containing mercury in any form is prohibited.

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3.8.1.1 Initial Non-wicking thread procedure. The test specimen shall consist of twenty-strand skein of thread in one continuous 30-yard (27.4m) length made on a 54-inch (1.37m) periphery skein reel or other suitable device for preparing the specimen. The skein shall be reeled under enough tension to cause the strands in the skein to lie uniformly, side by side, on the reel. The finishing end of the skein shall be tied to the starting end of the skein in such a manner that the knot will not add additional length to the reel skein. The skein shall be hung over the crossbar of the laboratory stand with the other end hanging over the vessel. The moveable crossbar shall rise 28 inches or more above the base. A nonferrous, 3/4 to 7/8 ounce (21 g to 25 g) weight shall be placed in the lower catenary of the skein to keep it taut and straight. The skein shall be arranged so that the strands are touching each other in flat ribbon form. The vessel shall be filled to a depth of at least 5 inches (127 mm) with distilled water at room temperature, which has been mixed with 0.05 percent Basic Blue 9 dye, color index 52015, salt and wetting agent free. A piece of blotting paper approximately 1 inch (25 mm) square, shall be attached by means of a paper clip or similar clamp to one full side (twenty strands) of the skein, 3 inches (76 mm) above the lower catenary of the skein. The position of the crossbar shall be adjusted so that when the skein is hung freely in the liquid, two inches of the skein will be immersed in the liquid and the lower edge of the blotter is 1 inch (25 mm) above the liquid surface. The skein shall then be slowly lowered into the dyebath and the time of entry shall be noted. Depending on the dimensions of the vessel and the length of the crossbar, several specimens can be tested at the same time in the same dyebath, by hanging the skeins sufficiently apart of the crossbar. The skein shall be exposed for 6 hours. The blotter shall be examined for wetting or staining at least once every hour. The test shall be terminated whenever staining or wetting of the blotter is observed, within the 6- hour test.

3.8.1.2 Accelerated Laundering Procedure. Prior to testing the thread shall be laundered in Launder-Ometer per AATCC 61, procedure 2A (120°F) except use 10 steel balls with small canister, 3 times with drying in between except as prepared below: The test specimen shall consist of a twenty-strand skein of thread in one continuous 30-yard length made on a 54- inch periphery skein reel. The skein shall be folded flat then twisted around its long axis for a total of 25 turns by use of a twist tester or other suitable device in the same direction as that of the final ply twist of the thread. The two ends shall be brought together and the folded skein allowed to back twist on itself. The ends shall be tied off to prevent untwisting during laundering. At the end of the laundering period, the specimen shall be removed from the jar and rinsed thoroughly in running water at a temperature of 104°F + 9°F and agitated occasionally during rinsing. Care should be exercised to insure that all traces of detergent are removed. The specimen shall then be extracted or wrung and oven dried at a temperature of 221°F to 230°F until thoroughly dry. Repeat procedure two more times, undo the tied ends from the skein, untwist skein and conduct procedure specified in 3.8.1.1.

3.9 Toxicity. The finished thread shall not present a health hazard and shall show compatibility with prolonged, direct skin contact when tested as specified in 3.9.1. Chemicals recognized by the Environmental Protection Agency (EPA) as human carcinogens shall not be used.

3.9.1 Toxicity test. When required, (see 6.2), an acute dermal irritation study and a skin sensitization study shall be conducted on laboratory animals. When the results of these studies indicate the thread is not a sensitizer or irritant, a Repeat Insult Patch Test shall be performed in

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accordance with the Modified Draize Procedure (see 2.3). If the toxicity requirement (see 3.9) can be demonstrated with historical use data, toxicity testing may not be required (see 7.3).

3.10 Put-up. Unless otherwise specified, the thread shall be put-up on holders such as commercial spools, cones, tubes or bobbins and shall be identified with weight and length as specified in the contract or purchase order. The thread shall be wound around the specified holder in one continuous length, so that each turn and layer is free of entanglement. The outside ending of the thread shall be secured to prevent unwinding, loosening, or slippage during handling, shipping, or storage.

3.10.1 Put-up and Bobbin Color Identification. Spools, cones, and tubes used for needle, looper and bobbin thread shall be color coded in accordance with Table X to identify the thread size. Bobbins may be colored with markers, other permanent means or stated color on storage box.

TABLE X Put-up and Bobbin Color Identification

Thread size 1/	Color ID/Pantone No. 2/, 3/	Thread size 1/	Color ID/Pantone No. 2/
00	White / 4/	FF	Dark Green / 348C
A	Pink / 176C	3	Grey / 7544C
AA	Black / 6C	4	Dark Blue/ 2728C
B	Opaque/ 7541C	5	Orange / 158 C
E	Yellow / 120C	6	Brown / 497C
F	Light Blue / 292C	8	Lime Green/360C

1/ These colors will be used for all Tex sizes that apply to these Government thread sizes.

2/ Pre-made bobbins may be colored with markers, other permanent means or stated color on storage box.

3/ Based on Pantone Solid Color Chip Coated Book, Dated 2003 (see 7.1.6)

4/ No Pantone color number in White Premade (see 7.1.6)

3.11 Labeling. Each holder shall have a label, adhered securely so as to remain in place and be clearly legible until all thread has been removed. The label shall be printed with the following information length in yards, direction of twist, color, size (Tex. no. or ticket number), name of thread manufacturer, weight, yards/pound and nomenclature specifying fiber and construction type. Type and Class, stock number, date of manufacture (month and year) shall be on the label.

3.12 Workmanship. The finished thread shall conform to the quality of product established by this document. The occurrence of defects shall not exceed the contractor's own quality assurance standards and the quality assurance standards defined by the technical data in the bid package.

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

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5. PRODUCT CONFORMANCE PROVISIONS.

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

6. PACKAGING.

6.1 Packaging. Preservation, packing, and marking shall be specified in the contract or order (see 7.3).

7. NOTES.

7.1 Sources of documents.

7.1.1 Copies of government documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

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

7.1.3 ASTM Standards are available online at www.astm.org or from ASTM INTERNATIONAL, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

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

7.1.5 Principles and Methods of Toxicology (fourth edition), A Wallace Hayes (editor), pp 1057 - 1060, 2001 is available online from <http://www.taylorandfrancis.co.uk/> or from Taylor and Francis, 325 Chestnut Street, Philadelphia PA 19106

7.1.6 Pantone Inc, World Headquarters, Carlstadt, NJ 07072-3098, (201) 935-5500

7.2 Standard samples, patterns and drawings.

7.2.1 Standard samples and pattern drawings, address the contracting activity issuing the invitation for bids or request for proposal. Standard samples are also available at DSCP through <http://warfighter.dla.mil> under tab "Vendor Info" then "General Vendor Info" then "Specifications/Pattern/Drawing/ Requests" under "Special Instructions" provide all applicable information to the solicitation/contract number.

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7.3 Ordering data.

- a. CID document number, title and revision.
- b. Type, Class, size, direction of twist, and ply of thread required (see 2.1, 2.2, 3.1, and 3.2).
- c. Color required (see 3.5).
- d. Toxicity requirement (see 3.9).
- e. Put-up required (see 3.10).
- f. Quality assurance standards (see 3.12)
- g. Product conformance provisions (see 5.1).
- h. Packaging requirements (see 6.1).

7.4 Key words.

Machine
Shoe

7.5 Intended use. The threads are intended for use, as applicable, in items of clothing, equipage and footwear, and in air delivery and safety equipment. Class B is used primarily for leather combat boots (direct molded sole), gloves and the Modular Lightweight Load carrying Equipment (MOLLE).

7.6. Restriction. Only Types I and II thread are normally authorized for use in parachutes and other flight safety equipment.

7.7 Colorfastness guidelines. Normally, colorfastness requirements for thread are to be specified in keeping with requirements for the basic material and end items as specified in Table VIII and with the following as examples in Table XI.

TABLE XI Colorfastness guidelines

Use	Colorfastness properties
Thread for sewing clothing which is dry-cleaned.	Good fastness to wet dry-cleaning, perspiration, and light.
Thread for sewing clothing which is laundered.	Good fastness to laundering (after 3 cycles), perspiration, and light.
Thread for sewing footwear.	No colorfastness tests apply.
Thread for sewing air delivery and safety equipment.	Good fastness to light and to laundering (after 3 cycles) or wet dry-cleaning as applicable.
Thread for sewing outside of hand-wear.	Good fastness to laundering (after 3 cycles), perspiration, dry-cleaning, and light.
Thread for sewing inside of hand-wear.	No colorfastness tests apply.
Thread for parachute and cargo.	Good fastness to weathering

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MILITARY INTERESTS:

Custodians:

Army – GL

Navy - NU

Air Force - 11

Review Activities:

Army - MD, MI, EA

Navy-AS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA-FAS

PREPARING ACTIVITY:

DLA-CT

Project No. 8310-2009-002

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>