INCH-POUND
MIL-DTL-16878H
w/AMENDMENT 1
12 January 2016
SUPERSEDING
MIL-DTL-16878H
11 March 2012

DETAIL SPECIFICATION

WIRE, ELECTRICAL, INSULATED, GENERAL SPECIFICATION FOR

Inactive for new design after 12 January 2016. For new design, use superseding document listed in Appendix A.

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

1. SCOPE

1.1 Scope. This specification covers unshielded wire for hookup and lead wiring of electrical and electronic components and equipment. The temperature rating of wire under this specification ranges from -65 to 260 degrees Celsius with potential rating from 250 to 5,000 volts root mean square (Vrms).

1.2 Classification. Wire is classified as to conductor material, size, stranding, and insulation color code (see 3.1 and 6.2).

1.2.1 Part or Identifying Number (PIN). The PIN consists of the following form:

M16878/03	B	C	B	*
Specification sheet number (see 1.2.2)	Conductor material (see 1.2.3)	Conductor size (see 1.2.4)	Conductor stranding (see 1.2.5)	Insulation color code (see 1.2.6)

1.2.2 Specification sheet number. The specification sheet number designation consists of the prefix M (which indicates a military specification item), the specification number, a slash, and the specification sheet number.

1.2.3 Conductor material. Conductor material is designated by a single letter as follows:

B - Coated copper
C - Coated copper-clad steel (C.C. Steel)
D - Coated high-strength copper alloy (H.S.C.A.)

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Columbus, Attn: VAI, P.O. Box 3990, Columbus, Ohio, 43218-3990 or emailed to WireCable@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil/.

1.2.4 Conductor size. The conductor American Wire Gage (AWG) size is designated by a single letter as follows (see 6.1.2):

AWG	Letter	AWG	Letter	AWG	Letter	AWG	Letter
32	A	20	G	8	N	00	W
30	B	18	H	6	P	000	Y
28	C	16	J	4	R	0000	Z
26	D	14	K	2	S		
24	E	12	L	1	T		
22	F	10	M	0	U		

1.2.5 Conductor stranding. The number of strands making up the conductor is designated by a single letter as follows:

Number of strands	Letter	Number of strands	Letter
1	A	133	L
7	B	168	M
10	C	259	N
16	D	665	P
19	E	817	R
26	F	1045	S
37	G	1330	T
41	H	1672	V
65	J	2109	W
105	K		

1.2.6 Insulation color code. The insulation color code is in accordance with the identification coding system of MIL-STD-681, and may be one, two, or three digits depending on the number or absence of stripes or bands. The first number is the color of the insulation; the second number is the color of the first stripe or band; and the third number is the color of the second stripe or band. Designation of the color code need not be imprinted on the wire. The colors and their corresponding numbers are as follows:

Color	Number designator	Color	Number designator
Black	0	Green	5
Brown	1	Blue	6
Red	2	Violet (purple)	7
Orange	3	Gray (slate)	8
Yellow	4	White	9

The colors listed are the preferred colors in accordance with FED-STD-595 unless the contracting activity specifies alternates (see 6.2).

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 cited in the solicitation or contract (see 6.2).

FEDERAL STANDARD

FED-STD-228	-	Cable and Wire, Insulated; Methods of Testing

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-C-572	-	Cords, Yarns, and Monofilaments, Organic Synthetic Fiber
MIL-Y-1140	-	Yarn, Cord, Sleeving, Cloth, and Tape-Glass

(See Supplement 1 for list of specification sheets.)

DEPARTMENT OF DEFENSE STANDARD

MIL-STD-104	-	Limits for Electrical Insulation Color

(Copies of these documents are available online at http://quicksearch.dla.mil

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASME INTERNATIONAL

ASME B46.1	-	Surface Texture (Surface Roughness, Waviness, and Lay)

(Copies of these documents are available online at http://www.asme.org.)

ASTM INTERNATIONAL

ASTM B33	-	Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes
ASTM B173	-	Standard Specification for Rope-Lay-Stranded Copper Conductors Having Concentric-Stranded Members, for Electrical Conductors
ASTM B286	-	Standard Specification for Copper Conductors for Use in Hookup Wire for Electronic Equipment
ASTM B298	-	Standard Specification for Silver-Coated Soft or Annealed Copper Wire
ASTM B355	-	Standard Specification for Nickel-Coated Soft or Annealed Copper Wire
ASTM B501	-	Standard Specification for Silver-Coated, Copper-Clad Steel Wire for Electronic Application
ASTM B520	-	Wire, Steel, for Electronic Applications, Tin-Coated, Copper-Clad
ASTM B559	-	Standard Specification for Nickel-Coated, Copper-Clad Steel Wire for Electronic Application
ASTM B624	-	Standard Specification for High-Strength, High-Conductivity Copper-Alloy Wire for Electronic Application

ASTM D1248	-	Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
ASTM D2802	-	Standard Specification for Ozone-Resistant Ethylene-Propylene Rubber Insulation for Wire and Cable
ASTM D4066	-	Standard Classification System for Nylon Injection and Extrusion Materials (PA)
ASTM G21	-	Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

(Copies of these documents are available online at http://www.astm.org.)

IPC – ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES

J-STD-006	-	Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications

(Copies of this document are available online at http://www.ipc.org.)

INSULATED CABLE ENGINEERS ASSOCIATION (ICEA)

ICEA T-24.380	-	Partial Discharge Test Procedure

(Copies of this document are available online at http://www.icea.net)

ISO International Standards

ISO/IEC17025	-	General requirements for the competence of testing and calibration laboratories

(Copies of these documents are available online http://www.iso.org.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA WC 52	-	High Temperature and Electronic Insulated Wire-Impulse Dielectric Testing
NEMA WC 56	-	3.0 kHz Insulation Continuity Proof Testing of Hook-up Wire

(Copies of this document are available from http://www.nema.org.)

SAE INTERNATIONAL

SAE AMS 3249	-	Ethylene Propylene (EPDM) Rubber Hydrazine-Base-Fluid Resistant

(Copies of these documents are available online at http://www.sae.org.)

UNDERWRITERS LABORATORIES (UL)

UL 1581	-	Reference Standard for Electrical Wires, Cables, and Flexible Cords

(Copies of these documents are available online at http://www.ul.com.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related 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. Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.3 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased 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.

3.4 Materials. Materials shall be as specified herein. When a material is not specified, a material shall be used that will enable the insulated wire to meet the performance requirements of this specification.

3.4.1 Conductors. Conductors shall be solid (see 6.1.3) or stranded as specified in table I, or as approved by the contracting activity (see 6.2), for the specific wire. Each strand of the conductor shall be of the same composition. When coated wires are used, individual strands shall be coated before stranding. Each strand shall have the same coating. Conductors shall meet the requirements specified in 3.4.1.1 through 3.4.1.7 before application of insulation.

3.4.1.1 Tin-coated copper conductors. Tin-coated copper conductors shall conform to ASTM B33 for soft or annealed copper.

3.4.1.2 Silver-coated copper conductors. Silver-coated soft or annealed copper conductors shall conform to ASTM B298 with a 40 microinches (minimum) thickness of silver.

3.4.1.3 Nickel-coated copper conductors. Nickel-coated soft or annealed copper conductors shall conform to ASTM B355 with a 50 microinches (minimum) thickness of commercially pure nickel.

TABLE I. Details of conductors.

Size designation (see 1.2.4)	Nominal conductor area (circular mils) 1/	Stranding (number of strands x AWG of strands)	Allowable number of missing strands (max)	Nominal diameter of individual strands (inch) 1/	Diameter of conductor		Maximum dc resistance of finished wire (ohms/1000 feet at 20 °C)					
							Soft or annealed copper			High-strength copper alloy 3/		Copper-clad steel
					Min (inch)	Max (inch)	Silver-coated	Nickel-coated	Tin-coated	Silver-coated	Nickel-coated	
32	64	1 X 32 2/	0	.0080	.0075	.009	169.0	175.00	178.00	200.0	205.0	451.0
32	67	7 X 40	0	.0031	.0088	.011	173.0	185.00	189.00	204.0	232.0	483.0
30	100	1 X 30 2/	0	.0100	.0095	.011	108.0	112.00	116.00	127.0	132.0	283.0
30	112	7 X 38 2/	0	.0040	.0110	.013	100.7	110.70	114.10	117.4	129.6	285.0
28	159	1 X 28	0	.0126	.0120	.013	68.0	70.00	71.60	80.0	82.0	184.0
28	175	7 X 36 2/	0	.0050	.0140	.016	63.8	67.90	68.60	74.4	79.0	178.0
26	253	1 X 26	0	.0159	.0150	.017	42.7	43.80	45.30	50.2	51.5	116.0
26	278	7X 34	0	.0063	.0180	.020	40.5	43.10	43.40	47.6	50.7	110.0
26	304	19 X 38 2/	0	.0040	.0180	.022	38.4	42.20	41.30	44.8	49.4	107.0
24	404	1 X 24	0	.0201	.0190	.022	26.8	27.40	27.80	31.4	31.9	71.4
24	448	7 X 32	0	.0080	.0230	.025	25.2	26.50	27.00	29.4	30.8	67.6
24	475	19 X 36 2/	0	.0050	.0230	.027	24.3	25.90	26.20	28.4	30.1	65.6
22	640	1X 22	0	.0253	.0247	.026	17.0	18.10	17.70	19.6	19.9	44.4
22	700	7X 30	0	.0100	.0280	.031	15.9	16.60	17.10	18.7	19.5	42.1
22	754	19 X 34 2/	0	.0063	.0290	.033	15.1	16.00	16.20	17.5	18.6	40.8
20	1020	1X 20	0	.0320	.0310	.033	10.5	10.70	10.90	12.2	12.6	-
20	1111	7 X 28	0	.0126	.0360	.039	10.0	10.40	10.70	11.8	12.2	-
20	1000	10 X 30	0	.0100	.0380	.040	11.3	11.80	12.10	-	-	-
20	1216	19 X 32 2/	0	.0080	.0370	.041	9.19	9.77	9.88	10.8	11.4	-
18	1620	1 X 18	0	.0403	.0390	.041	6.60	6.70	6.90	-	-	-
18	1770	7 X 26	0	.0159	.0470	.050	6.28	6.50	6.70	-	-	-
18	1608	16 X 30	0	.0100	.0480	.051	6.30	6.60	6.80	-	-	-
18	1900	19 X 30 2/	0	.0100	.0460	.052	5.79	6.10	6.23	-	-	-

TABLE I. Details of conductors - Continued.

Size designation (see 1.2.4)	Nominal conductor area (circular mils) 1/	Stranding (number of strands x AWG of strands)	Allowable number of missing strands (max)	Nominal diameter of individual strands (inch) 1/	Diameter of conductor		Maximum dc resistance of finished wire (ohms/1000 feet at 20 °C)					
							Soft or annealed copper			High-strength copper alloy 3/		Copper-clad steel
					Min (inch)	Max (inch)	Silver-coated	Nickel-coated	Tin-coated	Silver-coated	Nickel-coated	
16	2580	1 X 16	0	.0508	.0500	.052	4.20	4.35	4.36	-	-	-
16	2426	19 X29 2/	0	.0113	.0520	.059	4.52	4.76	4.81	-	-	-
16	2600	26 X 30	0	.0100	.0570	.062	4.31	4.55	4.69	-	-	-
14	4110	1 X 14	0	.0641	.0630	.065	2.58	2.67	2.68	-	-	-
14	3831	19 X 27 2/	0	.0142	.0650	.073	2.88	3.00	3.06	-	-	-
14	4100	41 X 30	0	.0100	.0720	.081	2.74	2.85	2.94	-	-	-
12	6530	1 X 12	0	.0808	.0790	.082	1.620	1.680	1.690	-	-	-
12	6088	19 X 25	0	.0179	.0820	.093	1.810	1.880	1.920	-	-	-
12	5874	37 X 28 2/	0	.0126	.0840	.091	1.900	1.980	2.020	-	-	-
12	6500	65 X 30	0	.0100	.0930	.099	1.730	1.800	1.850	-	-	-
10	10380	1 X 10	0	.1019	.1000	.103	1.020	1.050	1.060	-	-	-
10	9354	37 X 26 2/	0	.0159	.1060	.115	1.190	1.240	1.260	-	-	-
10	10500	105 X 30	0	.0100	.1180	.130	1.070	1.110	1.150	-	-	-
8	16800	168 X 30	0	.0100	.1600	.175	-	-	.708	-	-	-
8	16983	133 X 29 2/ /	0	.0113	.1580	.173	.658	.694	.701	-	-	-
6	26818	133 X 27	0	.0142	.1980	.217	.418	.436	.445	-	-	-
4	42615	133 X 25	0	.0179	.2500	.274	.264	.275	.280	-	-	-
2	66140	133 X 23	0	.0223	.3300	.355	.167	.171	.176	-	-	-
2	66304	259 X 26	0	.0159	.3250	.350	.174	.180	.186	-	-	-
2	66500	665 X 30 2/	2	.0100	.3200	.342	.170	.177	.183	-	-	-
1	83916	259 X 25	0	.0179	.3700	.398	.123	.129	.144	-	-	-
1	81700	817 X 30	2	.0100	.3600	.382	.139	.144	.149	-	-	-

TABLE I. Details of conductors - Continued.

Size designation (see 1.2.4)	Nominal conductor area (circular mils) 1/	Stranding (number of strands x AWG of strands)	Allowable number of missing strands (max)	Nominal diameter of individual strands (inch) 1/	Diameter of conductor			Maximum dc resistance of finished wire (ohms/1000 feet at 20 °C)				
								Soft or annealed copper		High-strength copper alloy 3/		Copper-clad steel
					Min (inch)	Max (inch)	Silver-coated	Nickel-coated	Tin-coated	Silver-coated	Nickel-coated	
0	105682	259 X 24	0	.0202	.4150	.444	.103	.108	.113	-	-	-
0	104500	1045 X 30 2/	3	.0100	.4050	.431	.108	.113	.116	-	-	-
00	133460	259 X 23	0	.0227	.4670	.492	.084	.088	.090	-	-	-
00	133000	1330 X 30 2/	3	.0100	.4500	.486	.085	.089	.091	-	-	-
000	167096	259 X 22	0	.0255	.5250	.560	.069	.072	.072	-	-	-
000	167200	1672 X 30 2/ /	4	.0100	.5180	.545	.068	.071	.071	-	-	-
0000	211851	259 X 21	0	.0286	.5900	.620	.053	.055	.055	-	-	-
0000	210900	2109 X 30 2/	5	.0100	.5800	.635	.054	.056	.056	-	-	-

1/ Nominal values are for information only. Nominal values are not requirements.
2/ Preferred stranding for the associated AWG size.
3/ No high-strength copper alloy conductors above size 20.

3.4.1.4 Silver-coated, copper-clad steel conductors. Silver-coated copper-clad steel conductors shall conform to class 40A of ASTM B501 with a 40 microinches (minimum) thickness of silver.

3.4.1.5 Nickel-coated copper-clad steel conductors. Nickel-coated copper-clad steel conductors shall conform to ASTM B559 with a 50 microinches minimum thickness of commercially pure nickel.

3.4.1.6 High-strength copper alloy conductors. High-strength copper alloy conductors shall conform to ASTM B624. The strands shall be silver- or nickel-coated in accordance with 3.4.1.2 or 3.4.1.3, as applicable.

3.4.1.7 Tin-coated, copper-clad steel conductors. Tin-coated copper-clad steel conductors shall conform to ASTM B520.

3.4.2 Insulation and jacket materials. Materials shall be as specified in 3.4.2.1 through 3.4.2.6, as designated in the applicable specification sheet.

3.4.2.1 Polyvinyl chloride (PVC). PVC or its copolymer polyvinyl acetate shall meet the requirements of the applicable specification sheet. Note: PVC-insulated wire is not to be used in aerospace applications or aboard Navy ships.

3.4.2.2 Polyamide (nylon). Polyamide shall conform to ASTM D4066 or, when used in braid, shall conform to type P of MIL-C-572.

3.4.2.3 Polyethylene (PE). PE shall conform to type II of ASTM D1248, except that colored material may be used.

3.4.2.4 Silicone rubber. Silicone rubber shall meet the requirements of the applicable specification sheet.

3.4.2.5 Ethylene-propylene diene elastomer (EPDM). EPDM shall conform to SAE AMS 3249.

3.4.2.6 Cross-linked material. Other materials are acceptable as substitutes for the above materials provided the cross-linked final product meets the requirements of the applicable specification sheet.

3.4.3 Braid material. The braid, when required by the applicable specification sheet, shall be synthetic textile conforming to type P of MIL-C-572 or glass yarn conforming to MIL-Y-1140.

3.5 Construction.

3.5.1 Conductors. Conductor construction shall be as specified in table I. Stranding shall be as specified in table I before insulation. The conductors shall be round in shape, uniform in cross section, and free from flaws, scales, and other imperfections. Unless otherwise specified (see 6.2), the method of stranding for AWG sizes 32 (single conductor) through 10 (105 stranding) inclusive, shall be at the option of the contractor. Rope lay stranding shall be used for AWG sizes 8 (133 stranding) and larger. Length of lay of finished, stranded conductors shall conform to ASTM B286 or ASTM B173, as applicable.

3.5.2 Insulation. A tight-fitting, continuous coating of insulation shall be added over the conductor and shall be cured, processed, or maintained to provide for accurate centering of the conductor (see 3.6.6). The insulation shall be free from splinters, blisters, and other non-homogeneities visible to the unaided eye. The insulation shall be constructed to be readily stripped from the conductor so that the conductor is clean for soldering or crimping. A clean conductor shall have no particles of insulation visible to the unaided eye.

3.5.3 Braid. When specified on the applicable specification sheet, a closely woven braid shall be applied over the insulation. Braid shall be saturated (or filled and coated) with fungus-, heat-, flame-, and moisture-resistant lacquers to a smooth finish that shall minimize fraying at the cut ends. Coatings shall be sufficiently translucent so as not to impair the visibility of any underlying color code of the braid materials when stripes are specified. Color carriers used in braids shall be one carrier (minimum) revolving in the same direction and shall be composed of synthetic textile or glass yarn (see 3.4.3). The braid shall not increase the outside diameter of the finished wire by more than the maximum amount specified in table II.

TABLE II. Outside diameter thickness increase after application of braid.

Diameter over insulation before application of braid (inch)	Diameter increase (inch, maximum)
.125 or less	.015
.126 – .250	.020
Greater than .250	.035

3.5.4 Jacket. When specified by the applicable specification sheet, a jacket shall be extruded over the insulation.

3.5.5 Insulation colors. Insulation colors shall conform to MIL-STD-104, class I, except that pastel colors shall be acceptable when cross-linking is done by irradiation. When insulation surfaces have been color-coded with inks or dyes, the insulation surfaces shall be nonconductive, permanently fast, and shall not change, fade, run, or bleed when used in direct sunlight and within the specific temperature rating of the insulation used.

3.5.5.1 Lay of stripes. When stripes are specified (see 6.2b and 1.2.6), the length of lay of colored stripes shall be as specified in table III.

TABLE III. Length of lay of stripes.

Finished wire outside diameter (inch)	Length of lay (inches, maximum)
.000 to .083	1.00
.084 to .110	1.50
.111 and larger	2.00

3.5.6 Splices. Splices shall not be made in a stranded conductor as a whole; however, individual strands and solid conductors may be spliced. Splices shall be made by electro-welding or brazing, using silver composition solder conforming to J-STD-006.

3.6 Performance. Unless otherwise specified herein, all requirements shall be met on finished wire.

3.6.1 Insulation flaws. After application of the primary insulation, the wire shall withstand the spark or impulse dielectric voltage specified in the applicable specification sheet without breakdown. After applications of braid or jacket, the finished wire shall withstand the spark or impulse dielectric voltage specified in the applicable specification sheet without breakdown.

3.6.2 Dielectric withstanding voltage. The wire shall withstand the specified voltage of the applicable specification sheet for 1 minute (minimum) without breakdown.

3.6.3 Insulation resistance. The insulation resistance shall not be less than the value specified on the applicable specification sheet.

3.6.4 Conductor resistance. The resistance of the wire conductor shall be not greater than the value specified in table I.

3.6.5 Cold bend. The wire shall reveal no readily visible cracks in the insulation when subjected to the cold bending conditions specified on the applicable specification sheet.

3.6.6 Concentricity. The concentricity of finished wire insulation to the conductor and of the primary insulation of multi-layered insulation or jacket to the conductor shall be 70 percent minimum.

3.6.7 Surface resistance (wire with outer braid only). The surface resistance shall be 5 megohm-inches minimum. A surface resistance of less than 1,000 megohm-inches shall not change by more than 50 percent from the initial measured value after the application of the high potential and re-measurement of surface resistance.

3.6.8 Heat resistance. After subjection to the heat resistance condition specified on the applicable specification sheet, wire shall exhibit no cracking or delamination of the insulation (and jacket, when applicable), no exudation of the insulation through the braid in constructions incorporating braid, and no readily visible defects in any of the wire component parts (slight discoloration after aging is considered normal and acceptable), and shall withstand the dielectric withstanding voltage specified on the applicable specification sheet.

3.6.9 Flammability. When subjected to an open flame, insulation shall not burn for more than the specified time nor release flaming particles, and the flame shall not travel more than the distance specified in the VW-1 flame test of UL1581.

3.6.10 Shrinkage. When subjected to contact with molten solder, insulation shall not flare away from the conductor, open up over the bent portion called for in the test, nor shrink back more than .125 inch.

3.6.11 Heat aging. After being aged for 96 hours at the temperature specified on the applicable specification sheet, insulation elongation and tensile strength shall not change more than the value specified on the applicable specification sheet.

3.6.12 Insulation tensile strength. The minimum tensile strength of insulation shall be as specified on the applicable specification sheet.

3.6.13 Insulation elongation. The minimum elongation of insulation shall be as specified on the applicable specification sheet.

3.6.14 Marking and stripe durability. Unless otherwise specified on the applicable specification sheet, wire markings and stripes shall remain legible after being repeatedly subjected to abrasion.

3.6.15 Fungus resistance. All non-metallic materials that are not fungus-inert shall be fungus-resistant.

3.6.16 Partial discharge (corona). When specified on the applicable specification sheet, the insulated wire shall be capable of withstanding exposure to an applied voltage 20 percent greater than the minimum partial-discharge extinction level specified in ASTM D2802.

3.7 Identification of product. Unless otherwise specified (see 3.1 and 6.2), finished wire shall be identified in accordance with the practices set forth under 1.2. A printed marking shall be applied to the outer surface of the wire or be visible through the outer surface. The printed identification shall be marked at intervals of 9 to 60 inches measured from the beginning of one complete marking to the beginning of the succeeding complete marking and shall consist of the following:

a. The first three elements of the PIN (see 1.2.2, 1.2.3, and 1.2.4).

b. Voltage rating.

c. Manufacturer's CAGE code or identifying mark.

Printing shall be of a contrasting color (black or white is preferable) in a permanent ink or dye. Identification printing shall be applied with the vertical axis of the printed characters either crosswise or lengthwise on the wire when the nominal diameter of the wire is greater than .050 inch. Identification printing shall be applied with the vertical axis of the printed characters lengthwise on the wire when the nominal diameter of the finished wire is .050 inch or smaller. Printed characters shall be complete and legible to the unaided eye.

3.8 Workmanship. Wire shall be free of kinks, abrasions, and cracked or peeled surfaces.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspections shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO/IEC 17025.

4.2 Classification of inspections. 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 required (see 6.2), first article inspection shall consist of all of the tests in groups A, B, and C of table IV.

4.4 Conformance inspection. Conformance inspection shall consist of the inspections listed in groups A and B of table IV. Conformance inspection shall be performed on every lot of wire procured under this specification.

4.4.1 Unit of product. The unit of product shall be the quantity of wire on one coil, one reel, or one spool, as applicable.

4.4.2 Inspection lot. Unless otherwise specified (see 6.2), an inspection lot shall consist of all wire of the same PIN, produced under essentially the same conditions, and presented for inspection and shipment at one time.

4.4.3 Group A inspection. Group A inspection shall consist of the inspections specified in group A of table IV. Group A inspection may be performed at an appropriate stage of the manufacturing operation rather than on the finished wire.

4.4.3.1 Visual and mechanical examination (except for splices). Three samples representative of the inspection lot shall be selected. Failure of any sample to pass these examinations shall constitute failure of the lot.

4.4.3.2 Insulation flaws. Wire shall be subjected to the insulation flaws test of 4.5.2. Insulation breakdowns resulting from this test, and ends or portions not subjected to the test, shall be cut out of the finished wire.

TABLE IV. First article and conformance inspections.

Inspection	Requirement	Verification
Group A		
Visual and mechanical examinations	3.1, 3.4, 3.5, 3.7, and 3.8	4.5.1
Insulation flaws: Spark test, or	 3.6.1	 4.5.2.1, or
Impulse dielectric test	3.6.1	4.5.2.2
Group B		
Dielectric withstanding voltage	3.6.2	4.5.3
Insulation resistance	3.6.3	4.5.4
Conductor resistance	3.6.4	4.5.5
Cold bend	3.6.5	4.5.6
Concentricity	3.6.6	4.5.7
Insulation tensile strength	3.6.12	4.5.13
Insulation elongation	3.6.13	4.5.14
Marking and stripe durability	3.6.14	4.5.15
Group C		
Surface resistance	3.6.7	4.5.8
Heat resistance	3.6.8	4.5.9
Flammability	3.6.9	4.5.10
Shrinkage	3.6.10	4.5.11
Heat aging	3.6.11	4.5.12
Fungus resistance	3.6.15	4.5.16
Partial discharge	3.6.16	4.5.17

4.4.4 Group B inspection. Group B inspections shall consist of the tests specified in group B of table IV. The sample shall be selected from inspection lots that have passed group A inspection.

4.4.4.1 Sampling . A random sample shall be selected from the inspection lot. The inspection sample size shall be in accordance with table V.

TABLE V. Inspection sample size for Group B conformance inspection.

Inspection lot size 1/	Sample size
1	1
2 to 8	2
9 to 90	3
91 to 150	12
151 to 280	19
281 to 500	21
501 to 1,200	27
1,201 to 3,200	35
3,201 to 10,000	38
10,001 to 35,000	46

1/ Lot size is based on the number of units of product (reels, spools, or coils) (see 4.4.1).

4.4.4.2 Specimen length. Unless otherwise specified herein, specimens for group B inspection shall be of the length specified in the applicable test method.

4.4.4.3 Rejected lots. Failure of any sample to pass these inspections shall constitute a failure of the lot. If an inspection lot is rejected, the contractor may rework the lot to correct the defects, or screen out the defective units and resubmit the lot for re-inspection. Such lots shall be separated from new lots and shall be identified as re-inspected lots (see 4.4.4.4).

4.4.4.4 Noncompliance. If a sample fails to pass group B inspections (see 4.4.4.3), the contractor shall notify the cognizant inspection activity of such failure and shall take corrective action on the materials, processes, or both, as warranted, on all units of the product. Acceptance and shipment of the product shall be discontinued until corrective action has been taken. After the corrective action has been taken, group B inspection shall be repeated on replacement articles. (This includes all tests and examinations, or only the test that the original sample failed, at the option of the cognizant inspection activity.) Final acceptance and shipment shall be withheld until group B inspection has shown that the corrective action was successful. In the event of failure after re-inspection, information concerning the failure shall be provided to the cognizant inspection activity.

4.5 Methods of inspection.

4.5.1 Visual and mechanical examination. Finished wire shall be examined to determine that the materials, physical dimensions, construction, splices, marking, and workmanship conform to the applicable requirements.

4.5.2 Insulation flaws.

4.5.2.1 Spark test. The spark test shall be performed in accordance with either (a) method 6211.1 of FED-STD-228 at a rate that subjects each point on the wire to 9 cycles (minimum) of voltage at 60 hertz (Hz), or (b) NEMA WC 56 for 12 cycles (minimum) at 3 kilohertz (kHz). The test voltage shall be as specified in the applicable specification sheet.

4.5.2.2 Impulse dielectric test. The impulse dielectric test shall be performed in accordance with NEMA WC 52, except that the insulation shall be either removed or identified for subsequent removal for a minimum of 3 inches on each side of the point of a dielectric failure. The test voltage shall be as specified in the applicable specification sheet.

4.5.3 Dielectric withstanding voltage test. The specimen shall be at least 26 feet long. One inch of insulation shall be removed from each end of the specimen and one end of the specimen shall be attached to an electric lead. The specimen shall be immersed in a 5±1 percent (by weight) solution of sodium chloride in water at 20 to 25 °C, except that the uninsulated ends plus 1.5 inches of insulated wire at each end shall be exposed to the air. After immersion for 1 hour, the voltage specified in the applicable specification sheet at 60 Hz shall be applied between the conductor and an electrode in contact with the liquid. The applied voltage shall be uniformly increased from zero to the specified peak voltage in 30±1 seconds, maintained at that voltage for a period of 1 minute, and uniformly reduced to zero in 30±1 seconds.

4.5.4 Insulation resistance test. The insulation resistance test shall be conducted on the same wire sample used for the dielectric withstanding voltage test (see 4.5.3). The test shall be performed in accordance with method 6031 of FED-STD-228 with the following exceptions:

a. The test voltage shall be 500±5 volts direct current (Vdc) applied for 60+5, -0 seconds.

b. The stirrer need not be used.

4.5.5 Conductor resistance test. The conductor resistance test shall be performed in accordance with method 6021.1 of FED-STD-228.

4.5.6 Cold bend test. The cold bend test shall be performed in accordance with method 2011 of FED-STD-228 with the following exceptions:

a. Specimen length shall be 12 inches plus the length required for wrapping on the mandrel.

b. Specimen shall be stripped to the bare conductor for 1 inch on each end.

c. Mandrel size shall be as specified on the applicable specification sheet.

d. Mandrels of less than 3-inch diameter shall rotate at a rate of 15±3 revolutions per minute.

e. Specimens shall be conditioned as specified on the applicable specification sheet.

f. Specimens for which a 3-inch or larger mandrel is specified shall be subjected to a 180-degree bend over the mandrel, then unwound and bent 180 degrees in the opposite direction over the mandrel. Specimens for which a mandrel less than 3 inches in diameter is specified shall be subjected to at least three close turns of wire on the mandrel and re-wrapped in the opposite direction in a similar manner.

g. The specimen shall be removed from the mandrel and examined without straightening.

h. The wire shall then be subjected to the dielectric withstanding voltage test specified in 4.5.3, except that the solution shall have a maximum temperature of 30 °C.

4.5.7 Concentricity test. The concentricity of the insulation shall be measured on a cross-section of the finished wire using 10X magnification. If the wire construction includes additional layers over the primary insulation, separate determinations shall be made for the primary insulation and finished wire. In making the determination, the minimum thickness of the primary insulation or finished wire shall be located and measured in the cross-section. The maximum thickness of the primary insulation or finished wire wall shall be located and measured in the same cross-section. The percent concentricity is 100

times the ratio of the minimum measurement to the corresponding maximum measurement. Three cross-sections shall be measured in each specimen. The failure of the concentricity of any cross-section shall constitute failure of the entire specimen.

4.5.8 Surface resistance test (wire with outer braid only). Surface resistance shall be measured in accordance with method 6041 of FED-STD-228 with the following exceptions and additions:

a. Two .25-inch electrodes consisting of ring-type metal foil shall be allowed.

b. Electrodes shall be attached near the center of the specimen length.

c. The specimen shall be conditioned at 25±5 °C and 95±5 percent relative humidity.

d. If the initial surface resistance is greater than 1,000 megohm-inches, the test shall be considered complete.

4.5.9 Heat resistance test. A specimen of finished wire, 12 inches long plus the length required for winding on the mandrel (see below), shall be subjected to the temperature specified on the applicable specification sheet for the following period:

a. All (except PE and EPDM insulation)	96+1, -0 hours
b. PE insulation	48+1, -0 hours
c. EPDM insulation	240+1, -0 hours

The specimen shall then be removed from the conditioning chamber and allowed to return to room temperature. If strand sealer has been used to make a watertight construction, the sealing compound shall not drip from the ends of the wire. The length of exposed conductor, if any, at each end of the specimen shall be considered as shrinkage of the insulation. In no case shall the shrinkage at either end exceed .125 inch. Following the oven aging, the specimen shall be wound tightly around a mandrel approximately (but not less than) three times the overall diameter of the wire for five close turns and removed as a helical coil. No readily visible defects shall result from this heating and coiling. The wire shall then be subjected to the dielectric withstanding voltage test specified in 4.5.3 except that the coiled sections shall be immersed (except for approximately 2 inches at each end) for 1 hour in tap water at room temperature.

4.5.10 Flammability test. Insulation flammability testing shall be performed in accordance with the VW-1 flame test method of UL 1581.

4.5.11 Shrinkage test. Finished wire shall be shrinkage tested in accordance with method 8231 of FED-STD-228.

4.5.12 Heat-aging test. The heat-aging test shall be performed in accordance with method 4031 of FED-STD-228 with the following exceptions:

a. Temperature shall be as specified on the applicable specification sheet.

b. Duration of heating shall be 96+1, -0 hours.

c. Specimens shall be left at room temperature from 16 to 48 hours before the tensile strength and elongation tests (see 4.5.13 and 4.5.14) are performed.

4.5.13 Insulation tensile strength test. The insulation tensile strength test shall be performed in accordance with method 3021 of FED-STD-228, except that the rate of travel of the power-actuated grip shall be between 2 inches (minimum) and 20 inches (maximum) per minute.

4.5.14 Insulation elongation test. The elongation test shall be performed in accordance with method 3031 of FED-STD-228, except that the rate of travel of the power-actuated grip shall be between 2 inches (minimum) and 20 inches (maximum) per minute.

4.5.15 Marking and stripe durability. The marking and stripe durability test shall be performed as specified in 4.5.15.1 and 4.5.15.2. The specimen shall consist of a piece of finished wire of sufficient length for use in the test. This test shall not apply to constructions that have clear jackets or braid over the primary insulation.

4.5.15.1 Test apparatus. The test apparatus shall include an abrading machine that shall support and secure the specimen so that it is straight and horizontal, and that shall abrade the specimen printed identification by means of a motor-driven, transversely reciprocating steel pin. This steel pin shall have a diameter of .025±.001 inch where it abrades the specimen, and shall have a surface roughness of not less than 2 micro-inches in accordance with ASME B46.1. The steel pin shall be horizontal and perpendicular to the specimen axis, shall ride along the top of the specimen, and shall be weighted to bear down on the specimen with a force of 1.00+.063, -0 pounds for wire size number 24 or larger, and .50+.125, -0 pounds for wire size 26 and smaller, at all times during the test. This pin shall be reciprocated at a rate of 60±2 cycles per minute, so that the pin is drawn along the specimen for a distance of .375+.063, -0 inch in each direction (.750 inch minimum total excursion) during each cycle.

4.5.15.2 Procedure. The specimen shall be wiped with a clean dry cloth to remove any lubricant or dirt and shall then be secured in the abrading machine with the specimen's printed identification facing upwards, where it is to be abraded by the steel pin. The automatic counter shall be set initially to zero. The abrading machine shall then be turned on to allow the steel pin to reciprocate and abrade the specimen's printed identification either until the printed identification is no longer legible in the abraded region, or until not less than 125 abrading cycles (250 strokes) have been completed, whichever occurs first. The number of abrading cycles completed shall be recorded. This test shall next be repeated four more times (a total of five times), subjecting a fresh portion of the specimen-printed identification to abrasion each time. Specimen failure shall be construed if the median value of the number of abrading cycles completed during the five tests is less than 125.

4.5.16 Fungus resistance. The fungus resistance test shall be performed in accordance with ASTM G21.

4.5.17 Partial discharge (corona) level test. A sample of finished insulated wire shall be tested in accordance with the procedures of ICEA T-24.380. The test shall be performed prior to the ac and dc voltage tests on the lead wire. The applied voltage shall be raised to a value equal to 20% greater than the minimum partial-discharge extinction level, but shall not exceed the required ac test voltage for the lead wire.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands.

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. This specification is being retained as a military detail specification because of the unique military requirements for use in systems operating in an environment from -65 °C to 260 °C. The single conductor wire covered in this specification is intended for use in lead wire and internal wiring of electrical and electronic equipment and switchboards. Note: PVC-insulated wire is not to be used in aerospace applications or aboard Navy ships.

6.1.1 Thin wall insulation. Users should exercise caution when selecting thin wall insulated wire. Wire having thin wall insulation of .007 inch thickness or less is intended for limited low voltage applications, is relatively fragile, easily damaged, and should not be used where mechanical stress or abrasive environment may exist. Use of this wire may not be appropriate in circuits requiring the highest degree of reliability. In order to appear consistent, the temperature rating is the same as assigned to heavier walls of the same dielectric material. However, care should be taken during installation to avoid damaging the dielectric with hot soldering iron or mechanical abuse and to leave no residual physical strain on the dielectric wall, because plastic flow may result in failures.

6.1.2 Stranded conductor size designations. The conductor sizes and the corresponding size designations of this specification are in accordance with established usage for stranded copper conductors for hookup wire in the electronic and aircraft industries. These sizes and size designations are not identical with AWG sizes for solid wire and stranded wire. The diameter and cross-sectional areas of the stranded conductors of this specification are, in most sizes, only roughly approximate to those of AWG solid conductors of the same numerical size designation.

6.1.3 Solid conductors. The users of solid conductors are cautioned that usage should be limited to lengths of less than 10 inches and is not recommended where flexing may occur or where the wire may be subjected to different vibratory modes along its length, such as between different chassis.

6.2 Acquisition requirements. Acquisition documents should specify the following:

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

b. Classification of wire required (see 1.2).

c. The specific issue of individual documents referenced (see 2.2.1 and 2.3).

d. Title, number, and date of applicable specification sheet(s) (see 3.1).

e. Whether first article is required (see 3.2). Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product that has been previously acquired or tested by the Government and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

f. If the conductor is to be different than specified (see 3.4.1).

g. Method of stranding for AWG sizes 10 and smaller, if other than specified (see 3.5.1).

h. Product identification requirements, if other than specified (see 3.7).

i. Quality conformance inspection lot, if other than specified (see 4.4.2).

j. Packaging requirements (see 5.1). These should include:

(1) Length of wire and form or put-up. Wire is normally furnished in continuous lengths of 500 or 1000 feet coiled on spools or reels at the contractor's option. No more than 25 percent of the total footage of any one wire PIN should be shipped in lengths less than minimum.

(2) Coil, spool, and reel marking requirements.

(3) Level of preservation, packing, and packaging options required, including fire-retardant material (when required) and special or unique storage or time conditions.

6.3 Subject term (key word) listing.

Conductor, solid
Conductor, stranded
Ethylene-propylene diene elastomer (EPDM)
Polyolefin, cross-linked
Polyamide
Polyethylene
Polyvinyl chloride (PVC)
Silicone rubber

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website at http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.5 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. 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 irrespective of the marginal notations.

APPENDIX A

SUPERSESSION AND CROSS REFERENCE DATA

A.1 GENERAL

A.1.1 Scope. This appendix provides a guide for supersession of wire types defined in MIL-W-16878F and its associated specification sheets (and earlier versions of both) to those covered in MIL-DTL-16878H and its associated specification sheets. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

A.2 APPLICABLE DOCUMENTS

A.2.1 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA HP 3	-	Electrical and Electronic PTFE (Polytetrafluoroethylene) Insulated High Temperature Hook-up Wire; Types ET (250 Volts), E (600 Volts), and EE (1000 Volts)
NEMA HP 4	-	Electrical and Electronic FEP (Fluorinated Ethylene Propylene) Insulated High Temperature Hook-up Wire; Types KT (250 Volts), K (600 Volts), and KK (1000 Volts)
NEMA HP 5	-	Electrical and Electronic Cross-linked, Modified Polyethylene (XLPE) Insulated125°C Hook-Up Wire, Types L (600 V), LL (1000 V), and LX (3000 V)
NEMA HP 6	-	Electrical and Electronic Silicone and Silicone Braided Insulated, Hook-Up Wire, Types S (600 V), ZHS (600 V), SS (1000 V), ZHSS (1000 V), and SSB Braided (1000 V)
NEMA HP 7	-	Electrical and Electronic PVC, PVC/Nylon, and PE/Nylon 105ºC Hook-Up Wire, Types B, C, D, BN, CN, and DN (600, 1000, and 3000 V), and Types J and JN 75ºC (600V)
NEMA HP 8	-	Electrical and Electronic Cross-Linked, Modified Low-Smoke Polyolefin (XLPO) Insulated Hook-Up Wire, Types LS (rated 105°C; 600 V), ZHDM (rated 90°C; 600 V), ZHDH (rated 90°C; 600 V), ZH (rated 125°C; 600 V), and ZHX (rated 125°C; 1000 V)
NEMA HP 9	-	Electrical and Electronic Ethylene-Propylene Diene Elastomer (EPDM) Insulated Hook-Up Wire, Types EP (Rated 125°C; 600 V) and EPD (Rated 125°C; 5000 V)

(Copies of this document are available from http://www.nema.org.)

A.3 SUPERSESSION DATA

GENERAL DESCRIPTION	MIL-W-16878D	MIL-W-16878E	MIL-W-16878F	MIL-DTL-16878G	MIL-DTL-16878H w/ Amd 1
600 VOLT, 105 ºC PVC	TYPE B	M16878/1			NEMA HP 7 Type B
		M16878/17			NEMA HP 7 Type BN
1000 VOLT, 105 ºC PVC	TYPE C	M16878/2			NEMA HP 7 Type C
		M16878/18			NEMA HP 7 Type CN
3000 VOLT, 105 ºC PVC	TYPE D	M16878/3			NEMA HP 7 Type D
		M16878/19			NEMA HP 7 Type DN
600 VOLT, 200 ºC/260 ºC PTFE	TYPE E	M16878/4			NEMA HP 3 Type E Ag Coated Extr. Const.
		M16878/21			NEMA HP 3 Type E Ag Coated Wrap Const.
		M16878/25			NEMA HP 3 Type E Ni Coated Extr. Const.
		M16878/26			NEMA HP 3 Type E Ni Coated Wrap Const.
1000 VOLT, 200 ºC/260 ºC PTFE	TYPE EE	M16878/5			NEMA HP 3 Type EE Ag Coated Extr. Const.
		M16878/22			NEMA HP 3 Type EE Ag Coated Wrap Const.
		M16878/27			NEMA HP 3 Type EE Ni Coated Extr. Const.
		M16878/28			NEMA HP 3 Type EE Ni Coated Wrap Const.
		M16878/34			NEMA HP 3 Type EE Ag Coated Wrap Const. (Dbl.)
		M16878/35			NEMA HP 3 Type EE Ni Coated Wrap Const. (Dbl.)
250 VOLT, 200 ºC/260 ºC PTFE	TYPE ET	M16878/6			NEMA HP 3 Type ET Ag Coated Extr. Const.
		M16878/20			NEMA HP 3 Type ET Ag Coated Wrap Const.
		M16878/23			NEMA HP 3 Type ET Ni Coated Extr. Const.
		M16878/24			NEMA HP 3 Type ET Ni Coated Wrap Const.
600 VOLT, SILICONE RUBBER	TYPE F	M16878/7			NEMA HP 6 Type S Cond. Mat. B
		M16878/29			NEMA HP 6 Type S Cond. Mat. H
1000 VOLT, SILICONE RUBBER	TYPE FF	M16878/8			NEMA HP 6 Type SS Cond. Mat. B
		M16878/30			NEMA HP 6 Type SS Cond. Mat. H
		M16878/31			NEMA HP 6 Type SSB Cond. Mat. H
		M16878/32			NEMA HP 6 Type SSB Cond. Mat. B
PE, 75 ºC	TYPE J	M16878/10			NEMA HP 7 Type J
		M16878/33			NEMA HP 7 Type JN
FEP, 600 VOLT, 200 ºC	TYPE K	M16878/11			NEMA HP 4 TYPE K
FEP, 1000 VOLT, 200 ºC	TYPE KK	M16878/12			NEMA HP 4 TYPE KK
FEP, 250 VOLT, 200 ºC	TYPE KT	M16878/13			NEMA HP 4 TYPE KT

XLPE, 600 VOLT, 125 ºC	- - -	M16878/14		NEMA HP 5	TYPE L
XLPE, 1000 VOLT, 125 ºC	- - -	M16878/15		NEMA HP 5	TYPE LL
XLPE, 3000 VOLT, 125 ºC	- - -	M16878/16		NEMA HP 5	TYPE LX
XLPO, 600 VOLT, 105 ºC	- - -		M16878/36	NEMA HP 8	TYPE LS
EPDM, 600 VOLT, 125 ºC	- - -		M16878/37	NEMA HP 9	TYPE EP
EPDM, 5000 VOLT, 125 ºC	- - -		M16878/38	NEMA HP 9	TYPE EPD

CONCLUDING MATERIAL

Custodians:
Navy - SH
Air Force - 85
DLA - CC

Preparing activity:
DLA - CC

(Project 6145-2015-054)

Review activity:
Navy - AS

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 https://assist.dla.mil.