REVISIONS			
LTR	**DESCRIPTION**	**DATE**	**APPROVED**
A	Revisions made to agree with SAE AS22759. Editorial changes throughout.	6/6/07	Lee Suroweic
B	Added approved supplier. Technical changes throughout.	12 March 2009	Abdo Abdouni
C	Added additional shield style to table X. Editorial changes throughout.	15 June 2010	Abdo Abdouni
D	Added approved supplier. Technical changes throughout.	1 December 2010	Abdo Abdouni

CURRENT DESIGN ACTIVITY CAGE CODE
037Z3 HAS CHANGED NAMES TO:
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

Prepared in accordance with ASME Y14.100

Selected item drawing

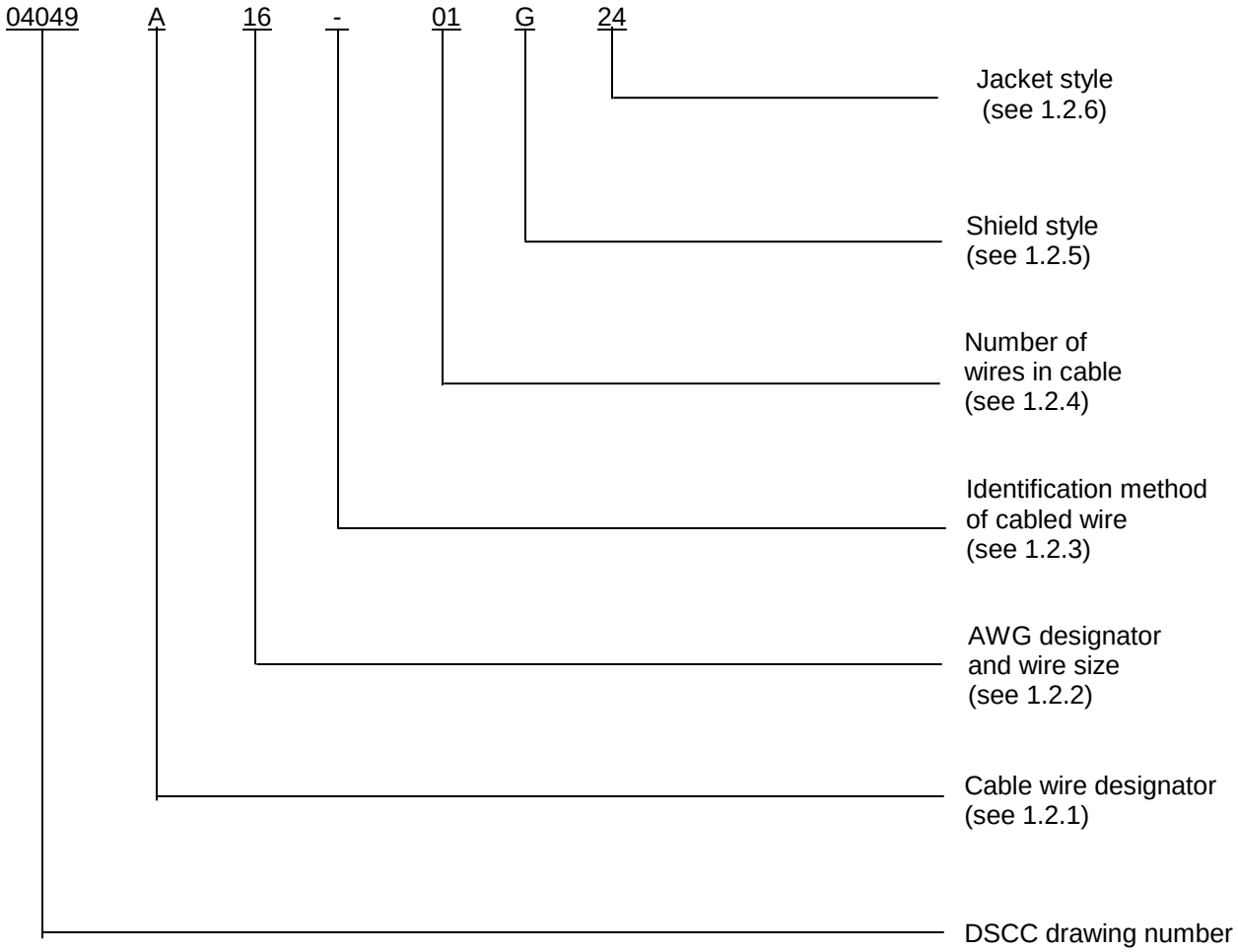
REV	D	D	D	D	D													
PAGE	15	16	17	18	19													
REV STATUS	**REV**		D	D	D	D	D	D	D	D	D	D	D	D	D	D		
OF PAGES	**PAGE**		1	2	3	4	5	6	7	8	9	10	11	12	13	14		

PMIC	**PREPARED BY** William Carpenter	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OHIO 43218-3990**
Original date of drawing 12 July 2004	**CHECKED BY** Lee Surowiec **APPROVED BY** Richard L. Taylor	**TITLE** **CABLE, POWER, ELECTRICAL AND SPECIAL PURPOSE, SHIELDED AND UNSHIELDED, ELECTRICAL, COMPOSITE WIRE, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED**
	SIZE **A** / **CAGE CODE** **037Z3**	**DWG. NO.** **04049**
	REV **D**	**PAGE** **1** OF **19**

1. SCOPE

1.1 Scope. This drawing covers the performance characteristics for finished cables. The component wires are covered by DSCC drawings 04034 through 04048. These cables are intended for signal and power applications with environmental or temperature conditions found in commercial aircraft, military aircraft, and high performance vehicles.

1.2 Part or Identifying Number (PIN). The PIN for individual wires are as specified on the DSCC drawing for that wire. The cable PIN is constructed as follows:



1.2.1 Cable wire designator. The cable wire designator is used to identify the individual component wire(s) of the cable. The cable wire designator should be a single letter as shown in tables I, II, and III.

1.2.2 American Wire Gage (AWG) designator. The PIN should include a one or two digit AWG designator (see table IV). Reference DSCC drawings listed in tables I, II and III for wire the AWG sizes available with each designator. All wires used in the cable will be of the same size.

1.2.3 Identification method for cable wire. The PIN should include a dash or single letter designator for the identification method used for the cabled wire (see table V and 3.3).

TABLE I. Light weight wire DSCC drawings.

Designator	DSCC drawing	Description	AWG range
A	04034	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Copper Conductor, Tin coated, 150°C, 600 volt	26 – 10
B	04035	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 volt	26 – 20
C	04036	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 volt	26 – 20
M	04045	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, Copper Conductor, 200°C, 600 Volt	26 – 10
N	04046	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, light Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volt	26 – 10
P	04047	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, 30, 28, 26 AWG, 600 Volt	30 – 26

TABLE II. Medium weight wire DSCC drawings.

Designator	DSCC drawing	Description	AWG range
G	04040	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volt	26 – 4/0
H	04041	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 volt	26 – 4/0
J	04042	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 volt	26 – 4/0
K	04043	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volt	26 – 20
L	04044	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volt	26 – 20
Q	04048	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, 26, 20, 18, 16 AWG, 600 Volt	26 – 16

TABLE III. Normal weight wire DSCC drawings.

Designator	DSCC drawing	Description	AWG range
D	04037	Wire, electrical, composite, polytetrafluoroethylene/polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volt	8 – 4/0
E	04038	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide insulated, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volt	8 – 4/0
F	04039	Wire, Electrical, Composite, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Tin Coated, Copper Conductor, 150°c, 600 Volt	8 – 4/0

TABLE IV. Gage size designator.

AWG designator	Wire size (AWG)
30	30
28	28
26	26
24	24
22	22
20	20
18	18
16	16
14	14
12	12
10	10
8	8
6	6
4	4
2	2
1	1
01	0
02	00
03	000
04	0000

TABLE V. Identification method and shield coverage designators.

Identification and shield coverage designator	Description	Shield coverage (if applicable)
-	Preferred identification method as specified in table VI	85%
A	Optional identification method A as specified in table VIII	85%
B	Optional identification method B as specified in table VIII and table IX	85%
C	Preferred identification method as specified in table VI	90%
D	Optional identification method A as specified in table VI	90%
E	Optional identification method B as specified in table VIII	90%
F	Preferred identification method as specified in table VII	85%
G	Optional identification method A as specified in table VII	85%
H	Preferred identification method as specified in table VII	90%
J	Optional identification method A as specified in table VII	90%
P	Optional identification method E as specified in table VIII and table IX	85%
R	Optional identification method E as specified in table VIII and table IX	90%
S	Optional identification method F as specified in table IX	85%
T	Optional identification method F as specified in table IX	90%

1.2.4 Number of wires per cable. The PIN should include a 2 digit number as the designator for the number of wires in the cable (see 3.4).

1.2.5 Shield style and material. A single letter as specified in table X should designate the shield style and material of the overall shield (see 3.5).

1.2.6 Jacket style and material. The jacket style and material should be as specified in table XIII (see 3.6).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.2 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.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-681 - Identification Coding and Application of Hookup and Lead Wire
MIL-STD-686 - Cable and Cord, Electrical; Identification Marking and Color Coding of

(Copies of these documents are available online at https://assist.daps.dla.mil/quicksearch/ or from the Standardization Document Order 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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.

ASTM INTERNATIONAL

ASTM B3 - Copper Wire, Soft or Annealed
ASTM B33 - Wire, Tinned Soft or Annealed for Electrical Purposes
ASTM B272 - Copper Flat Products with Finished (Rolled or Drawn) Edges (Flat Wire and Strip)
ASTM B298 - Wire, Copper, Silver Coated Soft or Annealed
ASTM B355 - Nickel-Coated Soft or Annealed Copper Wire
ASTM B624 - Wire, Copper Alloy, High Strength, High Conductivity Copper-Alloy Wire for Electronic Application
ASTM D4591 - Temperatures and Heats, Determining of Transitions of Fluoropolymers by Differential Scanning Calorimetry

(Copies of these documents are available from http://www.astm.org/ or ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959.)

NCSL INTERNATIONAL

NCSL-Z540.3 - General Requirements for Calibration of Measuring and Test Equipment

(Copies of these documents are available from http://www.ncsli.org or to National Conference of Standards Laboratories (NCSL), 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5404.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

NEMA WC27500 - Standard for Aerospace and Industrial Electrical Cable

(Copies of these documents are available from http://www.nema.org/ or NEMA, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209-3801)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AS4373	-	Test Methods for Insulated Electric Wire
SAE-AS22759/80	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Lightweight, Tin Coated, Copper Conductor, 150 Deg. C, 600 Volts
SAE-AS22759/81	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts
SAE-AS22759/82	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Nickel Coated, High Strength or Ultra High Strength Copper Alloy, 260°C, 600 Volts
SAE-AS22759/83	-	Wire, Electrical, Polytetrafluoroethylene/ Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200 °C, 600-Volt
SAE-AS22759/84	-	Wire, Electrical, Polytetrafluoroethylene/ Polyimide Insulated, Normal Weight, Nickel Coated, Copper Conductor, 260 °C, 600-Volt
SAE-AS22759/85	-	Wire, Electrical, Polytetrafluoroethylene/ Polyimide Insulated, Normal Weight, Tin Coated, Copper Conductor, 150 °C, 600-Volt
SAE-AS22759/86	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200 °C, 600 Volts
SAE-AS22759/87	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts
SAE-AS22759/88	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Tin Coated, Copper Conductor, 150°C, 600 Volts
SAE-AS22759/89	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, High Strength or Ultra High Strength Copper Alloy, 200°C, 600 Volts
SAE-AS22759/90	-	Wire, Electrical, Polytetrafluoroethylene/ Polyimide Insulated, Normal Weight, Nickel Coated, High Strength or Ultra High Strength Copper, Alloy, 260 °C, 600 Volts
SAE-AS22759/91	-	Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Light Weight, Silver Coated, Copper Conductor, 200 °C, 600 Volts
SAE-AS22759/92	-	Wire, Electrical, Polytetrafluoroethylene/ Polyimide Insulated, Light Weight, Nickel Coated, Copper Conductor, 260 Deg. C, 600 Volts

(Copies of these documents are available online at from http://www.sae.org or from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

3. REQUIREMENTS

3.1 DSCC requirements. Items shall meet the requirements of NEMA WC27500 except as specified herein. Any requirements included in this drawing shall be in addition to, or supersede those requirements included in NEMA WC27500. In case of conflict between the requirements in this drawing and those in NEMA WC27500, the requirements of this drawing shall take precedence.

3.2 Design configuration. The design, construction, and physical dimensions shall be this drawing.

3.2.1 Design documentation. Design documentation shall be retained by the manufacturer and shall be available upon request for review by the contracting activity, DSCC, or contractor.

3.2.2 Pure tin. The use of pure tin is prohibited both internally and externally. Tin content of wire braid, shield and jacketing components and solder shall not exceed 97 percent. Tin shall be alloyed with a minimum of 3 percent lead (see 6.9).

3.3 Identification method for cable wire and color requirements.

3.3.1 Preferred identification method. The insulation of wire used in the cable shall be white (or basic color or natural color) with one or two colored spiral stripes in table VI or table VII as applicable. The color stripe(s) may be applied by an inking process or be incorporated in the textile braid when the braid is employed in the basic wire. When the inking process is used, the stripe(s) shall be as specified in MIL-STD-681 except the stripe color and sequence shall be as specified herein. For wire diameters larger than .300 inch (7.62 mm), a longitudinal ink stripe is acceptable in lieu of a spiral stripe. When the braid is used, colored fibers shall be used for two parallel and adjacent carriers of the braid. The color identification fibers shall be woven in the opposite direction of any identification marker.

3.3.2 Optional identification method A. The insulation shall be a solid color as specified in table VI or table VII as applicable. Solid coloring shall be done by the manufacturer of the wire, and the coloring shall meet the requirements of the basic wire specification.

3.3.3 Optional identification method B. The insulation on each wire in the cable shall be the same solid color. The color shall denote wire size in table VIII. In order to identify each wire in the cable, color bands shall be applied as specified in table IX. Color of the bands shall be contrasting to the base color of the insulation. The narrow bands shall be 0.030 to 0.120 inch (0.76 to 3.05 mm) wide. The wide bands shall be twice the width of the narrow bands and spaced 0.030 to 0.120 inch (0.76 to 3.05 mm) apart in a group. Group separation shall be 0.38 to 1.50 inch (9.65 to 38.10 mm). The distance between the beginning of one group and the end of the next group shall be 3.0 inches (76.20 mm) maximum.

3.3.4 Optional identification method C. The insulation on each wire in the cable shall be the same solid color. The color shall denote wire size in table VIII. In order to identify each wire in the cable, the use of numbers imprinted on the insulation of the primary wire shall be used. The color of the numbers shall be a contrasting color to the base color of the insulation. The distance between the printed numbers shall be 3.0 inches (76.20 mm) maximum.

3.3.5 Optional identification method D. The insulation on each wire in the cable shall be white or natural. In order to identify each wire in the cable, the use of numbers imprinted on the insulation of the primary wire shall be used. The color of the numbers shall be contrasting to the base color of the insulation. The distance between the printed numbers shall be 3.0 inches (76.20 mm) maximum.

3.3.6 Optional identification method E. The insulation on each wire shall be white with the same colored helical stripe. The color of the stripe shall denote the wire size as specified in table VIII. In order to identify each wire in the cable, color bands shall be applied in table IX. The color of the bands shall be contrasting to the base color of the insulation. The narrow bands shall be 0.030 to 0.120 inch (0.76 to 3.05 mm) wide. The wide bands shall be twice the width of the narrow bands and spaced 0.030 to 0.120 inch (0.76 to 3.05 mm) apart in a group. Group separation shall be 0.38 to 1.50 inch (9.65 to 38.10 mm). The distance between the beginning of one group and the end of the next group shall be 3.0 inches (76.20 mm) maximum.

3.3.7 Optional identification method F. The insulation on each wire shall be white. In order to identify each wire in the cable, color bands shall be applied as specified in table IX. The color of the bands shall be contrasting to the base color of the insulation. The narrow bands shall be 0.030 to 0.120 inch (0.76 to 3.05 mm) wide. The wide bands shall be twice the width of the narrow bands and spaced 0.030 to 0.120 inch (0.76 to 3.05 mm) apart in a group. Group separation shall be 0.38 to 1.50 inches (9.65 to 38.10 mm). The distance between the beginning of one group and the end of the next group shall be 3.0 inches (76.20 mm) maximum.

3.3.8 Polyimide tape material. Polyimide tape material shall be hydrolysis resistant.

3.4 Number of wires per cable. The number of wires in the cable shall be from 1 to 15. The number of wires and the wire designator for each jacket/shield type shall be as follows:

a. 01 to 15 for shielded and jacketed cables.
b. 02 to 15 for unshielded and unjacketed.
c. 02 to 15 for unshielded jacketed cables.

3.5 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.

3.6 Workmanship. The cable shall be free of kinks, abrasions, and cracked or peeled surfaces. The cable shall be a uniform and consistent product and shall be free from defects that adversely affect the serviceability of the product.

TABLE VI. Circuit identification colors for basic wires.

No. of wires in cable	Wire number 1/														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	White														
2	White	Blue													
3	White	Blue	Orange												
4	White	Blue	Orange	Green											
5	White	Blue	Orange	Green	Red										
6	White	Blue	Orange	Green	Red	Black									
7	White	Blue	Orange	Green	Red	Black	Yellow								
8	White	Blue	Orange	Green	Red	Black	Yellow	Violet							
9	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray						
10	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown					
11	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown	Blue/Blue				
12	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown	Blue/Blue	Orange/Orange			
13	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown	Blue/Blue	Orange/Orange	Green/ Green		
14	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown	Blue/Blue	Orange/Orange	Green/ Green	Red/Red	
15	White	Blue	Orange	Green	Red	Black	Yellow	Violet	Gray	Brown	Blue/Blue	Orange/Orange	Green/ Green	Red/Red	Black/ Black

1/ For cables having more than 10 wires, the wires shall be identified by double tracers. Blue/Blue indicates a white base wire with double blue tracers.

TABLE VII. Identification colors for basic wires in cable.

No. of wires in cable	Identification colors for respective wires in cable 1/2/														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Red														
2	Red	Blue													
3	Red	Blue	Yellow												
4	Red	Blue	Yellow	Green											
5	Red	Blue	Yellow	Green	Basic										
6	Red	Blue	Yellow	Green	Basic	Black									
7	Red	Blue	Yellow	Green	Basic	Black	Brown								
8	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange							
9	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet						
10	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray					
11	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray	Red/ White				
12	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray	Red/ White	Blue/ White			
13	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray	Red/ White	Blue/ White	Yellow/ White		
14	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray	Red/ White	Blue/ White	Yellow/ White	Green / White	
15	Red	Blue	Yellow	Green	Basic	Black	Brown	Orange	Violet	Gray	Red/ White	Blue/ White	Yellow/ White	Green / White	Black/ White

1/ This color code was originally intended for basic wires as specified in MIL-W-5086 and associated replacement wire and cable.

2/ For cables having more than 10 wires, the wires shall be identified by a solid color with a stripe (red/white – indicates a red wire with a white stripe).

TABLE VIII. Color of insulation for identification of wire sizes. 1/

Wire size	Insulation color (solid)
30	Purple (violet)
28	Yellow
26	Black
24	Blue
22	Green
20	Red
18	White
16	Blue
14	Green
12	Yellow
10	Brown
8	Red
6	Blue
4	Yellow
2	Red
1	White
0	Blue
00	Green
000	Purple (violet)
0000	Black

1/ Color code for AWG sizes 26 through 00 are as specified in MIL-STD-686.

TABLE IX. Circumferential band configuration for wire number identification.

Wire number	Band group configuration	Number of bands
1	No marking	None
2		2 narrow
3		3 narrow
4		4 narrow
5		5 narrow
6		6 narrow
7		7 narrow
8		1 wide 1 narrow
9		1 wide 2 narrow
10		1 wide 3 narrow
11		1 wide 4 narrow
12		1 wide 5 narrow
13		2 wide 1 narrow
14		2 wide 2 narrow
15		2 wide 3 narrow

3.7 Shield style and material. A single letter in table X shall designate the shield style and material of the overall shield. The shield braid shall be a push back type. When the cable designation specifies that a shield is to be incorporated into the cable construction, either a closely woven braid of round strands or a closely woven braid of flat strands shall be applied over the basic wire or cable. The shield strands shall be free from lumps, kinks, abrasions, scraped or corroded surfaces, and surface impurities. The strand coating shall be smooth, continuous, and adherent to the underlying material.

TABLE X. Shield style.

Single shield style designator	Double shield style designator	Shield material	Maximum temperature limit (reference only)
U	Not applicable	No shield	Not applicable
T	V	Tin-coated copper, round	150°C
S	W	Silver-coated copper, round	200°C
N	Y	Nickel-coated copper, round	260°C
M	K	Silver-coated high strength copper alloy, round	200°C
P	L	Nickel-coated high strength copper alloy, round	260°C
G	A	Silver-coated copper, flat	200°C
H	B	Silver-coated high strength copper alloy, flat	200°C
J	D	Tin-coated copper, flat	150°C

3.7.1 Round shield.

3.7.1.1 Round shield strand material.

3.7.1.1.1 Round copper shield strands. Before shielding, the copper strands used in the shields shall be annealed or soft-drawn copper wire from commercially pure copper and shall conform to ASTM B3. Before application to the cable, individual silver, or nickel coated copper strands shall have a minimum elongation of 6 percent.

3.7.1.1.2 Round copper alloy shield strands. Before shielding, the high strength copper alloy strands shall conform to ASTM B624 except the minimum tensile strength shall be 55,000 lbf/in^2, the minimum elongation shall be 6 percent, and the conductivity shall be 80 percent (minimum).

3.7.1.2 Round shield strand coating.

3.7.1.2.2 Silver-coated copper and copper alloy strands. When the cable designation specifies a silver-coated shield, the individual strands shall be coated uniformly with a smooth continuous layer of commercially pure silver. Prior to braiding, silver-coated copper strands shall meet the requirements of ASTM B298. Silver-coated high strength copper alloy strands shall meet the requirements of 3.7.1.1.1 and the adhesion and the continuity of coating requirements of ASTM B298. The thickness of the silver shall not be less than 40 microinches (1.02 µm).

3.7.1.2.3 Nickel-coated copper and copper alloy strands. When the cable designation specifies a nickel-coated shield, the individual strands shall be coated uniformly with a smooth continuous layer of commercially pure nickel. The thickness of the nickel coating shall be not less than 50 microinches (1.27 µm), nor greater than 250 microinches (6.35 µm) nickel-coated copper strands shall meet the coating requirements of ASTM B355 prior to braiding. Nickel-coated high strength copper alloy strands shall meet the requirements of 3.7.1.1.2 and the adhesion and continuity of coating requirements of ASTM B355.

3.7.1.3 Round copper or copper alloy strand size. Cables with braided shields as specified in round copper or round copper alloy strands shall conform to the shield group A or B (see tables XI and XII). The core diameter referred to in group A or B shall be the nominal outside core diameter of the unshielded, unjacketed cable equal to the basic wire nominal diameter multiplied by factor A for filled cables and factor G for unfilled cables in table XII.

TABLE XI. Round shield strand size.

Shield strand size (AWG)	Cable core diameter (inch)	Cable core diameter (mm) 1/
38	.000 to .250	0.00 to 6.35
36	.251 to .400	6.375 to 10.16
34	.401 to .1.00	10.182 to 25.4
32	1.001 inches and larger	25.425 and larger

1/ Metric equivalents are given for general information only.

TABLE XII. Cable and geometry factors.

Number of conductors	A 1/	B 2/	G 3/
1	1.00	1.0	1.00
2	2.00	1.8	1.64
3	2.16	2.1	1.95
4	2.73	2.4	2.27
5	3.00	2.7	2.59
6	3.00	3.0	2.87
7	3.00	3.0	2.91
8	3.72	3.4	3.38
9	4.05	3.6	3.55
10	4.08	3.8	3.65
11	4.16	4.1	3.95
12	4.16	4.1	3.95
13	4.75	4.4	4.27
14	4.75	4.4	4.27
15	5.00	4.7	4.59

1/ Geometry factor for cables filled to round (See 3.7.1.3 and NEMA WC27500 “braid angle and shield coverage” and “cable diameter”).
2/ Geometry factor for cable weight calculation (See NEMA WC27500 “cable weight”).
3/ Geometry factor for unfilled cables (See 3.7.1.3 and NEMA WC27500 “braid angle and shield coverage”).

3.7.2 Flat shield.

3.7.2.1 Flat shield strand material.

3.7.2.1.1 Flat copper shield. Strands flattened copper wire shall meet the requirements of ASTM B272 except the wire shall be made by flattening round wire.

3.7.2.1.2 Flat copper alloy shield strands. Flat high strength copper alloy wire shall be made by flattening round wire. The flattened wire tensile strength shall be not less than 55,000 Ibf/in^2 (3867 kilogram/centimeter^2), and the elongation shall be one (1) percent minimum after flattening.

3.7.2.2 Flat shield strand coating.

3.7.2.2. 1 Silver-coated copper and copper alloy strands. Silver-coated copper and silver-coated high strength copper alloy strands before flattening shall conform to ASTM B298. Flattened wire strands shall meet the continuity of coating requirements in accordance with ASTM B298. The thickness of coating shall be 40 microinches (1.02 µm) minimum after flattening.

3.7.2.2.3 Nickel-coated copper and copper alloy strands. Nickel-coated copper and nickel-coated high strength copper alloy strands before flattening shall conform to ASTM B355. Flattened wire strands shall meet the continuity of coating requirements in accordance with ASTM B355. The thickness of coating shall be 50 microinches (1.27 µm) minimum after flattening.

3.7.2.3 Flat shield strand size. Flat wire shields shall be braided of copper, high-strength copper alloy, or nickel chromium alloy. The flattened wire shall be 0.0015 inch to 0.0004 inch (0.29 to 0.10 mm) thickness.

3.7.3 Shield splices. If splices are used in the shield, they shall not affect the geometry of the finished cable. No more than one carrier may be spliced at any one point in the shield.

3.7.4 Braid angle and shell coverage. The angle of the carriers of the braid with the axis of the cable in woven wire shields shall be not less than 18º nor more than 40º. When the major diameter of the cable beneath the braid is greater than 0.31 inches (0.79 mm), the above braid angle restriction shall not apply. In this case, the shield shall be suitably applied to provide good push-back characteristics. (See NEMA WC27500 for formulas to calculate “braid angle” and “percent coverage of the braid”).

3.8 Jacket style and material. The jacket style and material shall be as specified in table XIII.

TABLE XIII. Jacket material.

Jacket style designator	Jacket material	Maximum temperature limit (reference only)
00	No jacket	Not applicable
06	Taped and heat sealed white polytetrafluoroethylene (PTFE)	260°C
24	Tape layer of white PTFE wrapped over a tape layer of natural polyimide combined with FEP and heat sealed	260°C

3.8.1 Taped polyimide/polytetrafluoroethylene jacket. The jackets of polyimide/polytetrafluoroethylene shall consist of two tapes:

a. The inner tape shall be dependent on the diameter of the cabled wires under the jacket.

(1) For cable construction with an under the jacket diameter of .500 inches (12.70 mm) or less

a. Jacket thickness shall be .006 to .010 inch (0.15 to 0.25 mm). The inner tape shall be a fluoropolynmer/polyimide/fluoropolymer coated tape .001 inch (0.03 mm) minimum thickness applied with a minimum 50 percent overlap. The outer tape shall be an unsintered seamless PTFE tape .002 inch (0.05 mm) nominal thickness applied in an opposite direction to the first tape and with a minimum 50 percent overlap.

(2) For cable construction with an under the jacket diameter of.501 (12.72 mm) inches or more.

a. Jacket thickness shall be.008 to .012 inch (0.20 to 0.30 mm). The inner tape shall be a fluoropolynmer/polyimide/fluoropolymer coated tape .001 inch (0.03 mm) minimum thickness applied with a minimum 50% overlap. The outer tape shall be an unsintered seamless PTFE tape .002 inch

(0.05 mm) nominal thickness shall be applied in the opposite direction to the first tape and with a minimum 67 percent overlap.

b. After sintering, the bonding between FP layer will be homogenous. No evidence of tape edges or seams will be present when visually examined with the unaided eye. The outer surface will be smooth and free of tape edges at the overlap. The PTFE material shall be formulated in such a manner to achieve a minimum average contrast of 62% when marked with an ultraviolet (UV) laser source at a maximum energy of 1.5j/cm^2.

3.8.2 Taped PTFE jacket. Taped PTFE jackets shall have a wall thickness specified in table XIV. The jacket shall consist of a minimum of two contrahelically wrapped tapes each applied with a minimum 25 percent overlap. After sintering, the bonding between tape layers will be homogenous. No evidence of tape edges or seams will be present on the outer PTFE layer when visually examined with the unaided eye. The outer surface will be smooth and free of tape edges at the overlap.

TABLE XIV. Jacket wall thickness. 1/2/

Diameter of cable beneath jacket (inches)	Jacket material designation (inches)	Diameter of cable beneath jacket (mm)	Jacket material designation (mm)
	06		06
Up to .150	.010 to .015	Up to 3.81	0.25 to 0.38
.151 to .200	.010 to .015	3.84 to 5.08	0.25 to 0.38
.201 to .250	.010 to .015	5.11 to 6.35	0.25 to 0.38
.251 to .300	.010 to .015	6.38 to 7.62	0.25 to 0.38
.310 to.400	.015 to .025	7.87 to 10.16	0.38 to 0.64
.401 to .500	.015 to .025	10.19 to 12.70	0.38 to 6.34
.501 to .600	.020 to .030	12.53 to 15.24	0.51 to 0.76
.601 to .700	.020 to .030	15.27 to 17.68	0.51 to 0.76
.710 to .750	.020 to .030	18.03 to 19.05	0.51 to 0.76
.751 to .800	.020 to .030	19.08 to 20.32	0.51 to 0.76
.801 to 1.000	.020 to .030	20.35 to 25.40	0.51 to 0.76
over 1.000	.020 to .030	over 25.40	0.51 to 0.76

1/ Metric equivalents are given for information only.
2/ Dimensions are in inches.

3.9 Cable lay-up. For multi-conductor construction, wires shall be cabled with a left-hand lay. The lay of the individual wires shall be not less than 6 nor more than 16 times the outside major axis diameter of the unshielded, unjacketed cable as specified in 4.4. The basic wire shall not be spliced. When cables are cut, wires shall not splay more than twice the diameter of the cable.

3.10 Polyimide tape. The polyimide tape used for the individual component wires and jackets shall be hydrolysis resistant.

3.11 Voltage rating. 600 Vrms at sea level.

3.12 Marking. The cable assembly shall be marked with the complete DSCC PIN, the manufacturers name or CAGE code, and the production date code. The marking shall be permanent and legible.

4. VERIFICATION

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

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.1.1 Equipment calibration. All test equipment and inspection facilities shall be maintained as specified in NCSL-Z540.3 or equivalent.

4.2 Qualification inspection. Not required.

4.3 Conformance inspection. Conformance inspection shall be as specified in NEMA WC27500 and DSCC drawing 04049.

4.4 Certification. In order to be certified and listed as an approved source of supply for cable manufactured to this drawing, a manufacturer shall:

a. Agree to make available to DSCC, upon request, all pertinent test data indicating compliance to the tests specified in NEMA WC27500 and this drawing.

b. Provide to DSCC-VAI, or its designated agent, upon request, free of change and without obligation, current production samples of the types and quantities requested.

c. Meet one of the following criteria:

(1) Currently be listed on QPL-22759 for at least one wire within the series SAE-AS22759/80 through SAE-AS22759/92.

(2) Be in current production of the subject part.

4.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.7).

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

6.1 Intended use. Cables conforming to this drawing are intended for use when military specifications do not exist for cables that will perform the required function. This drawing is intended to prevent the proliferation of unnecessary duplicate specifications, drawings and stock catalog listings.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Complete PIN (see 1.2).

b. Requirements for delivery of a copy of the conformance inspection data for the lot being supplied, if applicable. This data should be supplied with each shipment.

c. Requirements for certificate of compliance, if applicable.

d. Requirements for packaging and packing.

6.3 Replaceability. Cables covered by this drawing will replace the same generic wires covered by a contractor-prepared specification or drawing.

6.4 Comments. Comments on this drawing should be directed to DSCC-VAI, Post Office Box 3990, Columbus, Ohio 43218-3990 or e-mail: WireCable@dla.mil, telephone (614) 692-0571, facsimile (614) 692-6939.

6.5 Certificate of compliance. The certificate of compliance submitted to DSCC-VAI, prior to listing as an approved source of supply, should state that the manufacturer's product meets the requirements of this drawing.

6.6 Generic test data. Generic test data may be used to satisfy the requirements of 4.3. Generic test data should be on date coded cables no more than 1 year old when the cable is made of the same material, of the same design, and is made as specified in the same manufacturing processes. The vendor is required to retain the generic data for a period of not less than 3 years from the date of shipment.

6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed have agreed to the contents of this drawing and a certificate of compliance has been submitted to DSCC-VAI (see table XV).

6.7.1 DSCC drawing PIN. Due to the number of possible DSCC drawing PINs and vendor similar PINs, individual PINs are not listed on this drawing.

TABLE XV. Approved source of supply.

/DSCC drawing PIN 1/	Vendor CAGE number	Vendor CAGE number	Vendor CAGE number	Vendor similar PIN 1/ 2/
04049AWW-XXYZZ	12814	12515	F1868	D04049AWW-XXYZZ
04049BWW-XXYZZ	12814	12515	F1868	D04049BWW-XXYZZ
04049CWW-XXYZZ	12814	12515	F1868	D04049CWW-XXYZZ
04049DWW-XXYZZ	12814	12515	F1868	D04049DWW-XXYZZ
04049EWW-XXYZZ	12814	12515	F1868	D04049EWW-XXYZZ
04049FWW-XXYZZ	12814	12515	F1868	D04049FWW-XXYZZ
04049GWW-XXYZZ	12814	12515	F1868	D04049GWW-XXYZZ
04049HWW-XXYZZ	12814	12515	F1868	D04049HWW-XXYZZ
04049JWW-XXYZZ	12814	12515	F1868	D04049JWW-XXYZZ
04049KWW-XXYZZ	12814	12515	F1868	D04049KWW-XXYZZ
04049LWW-XXYZZ	12814	12515	F1868	D04049LWW-XXYZZ
04049MWW-XXYZZ	12814	12515	F1868	D04049MWW-XXYZZ
04049NWW-XXYZZ	12814	12515	F1868	D04049NWW-XXYZZ
04049PWW-XXYZZ	12814	12515	F1868	D04049PWW-XXYZZ
04049QWW-XXYZZ	12814	12515	F1868	D04049QWW-XXYZZ

1/ Legend:
WW = Wire size (AWG) (see 1.2.1).
XX = Identification method (see 1.2.3)
Y = Shield style (see 1.2.5)
ZZ = Jacket style (see 1.2.6)

2/ Parts must be purchased to this DSCC PIN to assure that all performance requirements and tests are met.

Vendor CAGE Code	Vendor name and address
12814	Thermax/CDT 235 North Freeport Drive Nogales, AZ 85621-2428
12515	Berk-Tek Electronics Cable 600 South Parker Street, P.O. Box 909 Elm City, NC 27822
F1868	Draka Fileca Route Nationale 1 60730 Sainte Genevieve France

6.8 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 http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the EPA 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).

6.9 Tin whisker growth. The use of alloys with tin content greater than 97 percent may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture, and can develop under typical operating conditions on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead have shown to inhibit the growth of tin whiskers (see 3.2.2).

6.10 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.