INCH-POUND

MIL-DTL-27500H
10 December 1997
SUPERSEDING
MIL-C-27500G
23 FEB. 1990

DETAIL SPECIFICATION

CABLE, POWER, ELECTRICAL AND CABLE SPECIAL PURPOSE, ELECTRICAL SHIELDED AND UNSHIELDED, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers the requirements for special purpose and power electrical cable. (see 6.1)

1.2 Classification. The cable will be of the following types and will be furnished in the basic wire size, type, number of wires, and shield and jacket styles, as specified. (see 6.2 and 6.3)

Unjacketed - 2 to 15 color-coded wires, spirally laid without an overall outer jacket.

Jacketed - 2 to 15 color-coded wires, spirally laid with an overall outer jacket.

Shielded - A single wire, or 2 to 15 color-coded wires spirally laid, with one or two overall shields.

Shielded and Jacketed - A single wire, or 2 to 15 color-coded wires spirally laid with one or two shields and one or two jackets.

1.2.1 Cable Specification. The finished cable will be identified by the number of this specification. (See 6.3)

1.2.1.1 Identification method of cable wire (with shield coverage). When an unshielded cable or wire, or a cable with a minimum shield coverage of 85 percent is required, specify:

"-" for the preferred identification method using Table III A.
"F" for the preferred identification method using Table III B.
"A" for optional identification method A, Table III A.
"G" for optional identification method A, Table III B
"B" for optional identification method B, Table III C
"K" for optional identification method C
"L" for optional identification method D

Beneficial comments (recommendations, additions, deletions,) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center Columbus, Attn: DSCC-VAI, 3990 East Broad Street, Columbus Ohio, 43216-5000 , using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of the document or by letter.

When a minimum shield coverage of 90 percent is required, specify;

"C" for the preferred identification method using Table III A.
"H" for the preferred identification method using Table III B.
"D" for optional identification method A, Table III A.
"J" for optional identification method A, Table III B
"E" for optional identification method B, Table III C.
"M" for optional identification method C
"N" for optional identification method D

1.2.1.2 Conductor size. The basic wire size will be identified. All wires used in the cable will be of the same size.

1.2.1.3 Basic wire specification. A letter symbol will be used to designate the specification, type, and class in accordance with table I.

TABLE I Basic wire specification.

Symbol sequence				Specification sequence			
A	MIL-W-5086/1 1/	NK	MIL-W-81381/21 3/	MIL-W-5086/1 1/	A	MIL-W-22759/43	SP
AA	MIL-W-5086/5 1/	NL	MIL-W-81381/22 3/	MIL-W-5086/2 1/ 2/	B	MIL-W-22759/44	SR
AB	MIL-W-5086/6 1/	P	MIL-W-5086/4 1/	MIL-W-5086/3 1/ 2/	C	MIL-W-22759/45	SS
AD	MIL-W-5086/7 1/	RA	MIL-W-22759/3	MIL-W-5086/4 1/	P	MIL-W-22759/46	ST
B	MIL-W-5086/2 1/ 2/	RB	MIL-W-22759/4	MIL-W-5086/5 1/	AA	MIL-W-22759/80 3/	WB
C	MIL-W-5086/3 1/ 2/	RC	MIL-W-22759/11	MIL-W-5086/6 1/	AB	MIL-W-22759/81 3/	WC
CA	MIL-W-22759/13	RE	MIL-W-22759/12	MIL-W-5086/7 1/	AD	MIL-W-22759/82 3/	WE
CB	MIL-W-22759/14	SA	MIL-W-22759/7	MIL-W-8777, MS25471	H	MIL-W-22759/83 3/	WF
CC	MIL-W-22759/15	SB	MIL-W-22759/32	MIL-W-8777, MS27110	F	MIL-W-22759/84 3/	WG
E	MIL-W-22759/2	SC	MIL-W-22759/33	MIL-W-22759/1	EA	MIL-W-22759/85 3/	WH
EA	MIL-W-22759/1	SD	MIL-W-22759/34	MIL-W-22759/2	E	MIL-W-22759/86 3/	WJ
F	MIL-W-8777, MS27110	SE	MIL-W-22759/35	MIL-W-22759/3	RA	MIL-W-22759/87 3/	WK
H	MIL-W-8777, MS25471	SM	MIL-W-22759/41	MIL-W-22759/4	RB	MIL-W-22759/88 3/	WL
JA	MIL-W-25038/1	SN	MIL-W-22759/42	MIL-W-22759/5	VA	MIL-W-22759/89 3/	WM
JB	MIL-W-22759/28	SP	MIL-W-22759/43	MIL-W-22759/6	WA	MIL-W-22759/90 3/	WN
JC	MIL-W-22759/29	SR	MIL-W-22759/44	MIL-W-22759/7	SA	MIL-W-22759/91 3/	WP
JD	MIL-W-22759/30	SS	MIL-W-22759/45	MIL-W-22759/8	TA	MIL-W-22759/92 3/	WR
JE	MIL-W-22759/31	ST	MIL-W-22759/46	MIL-W-22759/9	LE	MIL-W-25038/1	JA
JF	MIL-W-25038/3	TA	MIL-W-22759/8	MIL-W-22759/10	LH	MIL-W-25038/3	JF
LE	MIL-W-22759/9	TE	MIL-W-22759/16	MIL-W-22759/11	RC	MIL-W-81044/5 2/	MD
LH	MIL-W-22759/10	TF	MIL-W-22759/17	MIL-W-22759/12	RE	MIL-W-81044/6	ME
MD	MIL-W-81044/5 2/	TG	MIL-W-22759/18	MIL-W-22759/13	CA	MIL-W-81044/7	MF
ME	MIL-W-81044/6	TH	MIL-W-22759/19	MIL-W-22759/14	CB	MIL-W-81044/8 2/	MG
MF	MIL-W-81044/7	TK	MIL-W-22759/20	MIL-W-22759/15	CC	MIL-W-81044/9	MH
MG	MIL-W-81044/8 2/	TL	MIL-W-22759/21	MIL-W-22759/16	TE	MIL-W-81044/10	MJ
MH	MIL-W-81044/9	TM	MIL-W-22759/22	MIL-W-22759/17	TF	MIL-W-81044/11 2/	MK
MJ	MIL-W-81044/10	TN	MIL-W-22759/23	MIL-W-22759/18	TG	MIL-W-81044/12	ML
MK	MIL-W-81044/11 2/	VA	MIL-W-22759/5	MIL-W-22759/19	TH	MIL-W-81044/13	MM
ML	MIL-W-81044/12	WA	MIL-W-22759/6	MIL-W-22759/20	TK	MIL-W-81381/7 3/	MR
MM	MIL-W-81044/13	WB	MIL-W-22759/80 3/	MIL-W-22759/21	TL	MIL-W-81381/8 3/	MS
MR	MIL-W-81381/7 3/	WC	MIL-W-22759/81 3/	MIL-W-22759/22	TM	MIL-W-81381/9 3/	MT
MS	MIL-W-81381/8 3/	WE	MIL-W-22759/82 3/	MIL-W-22759/23	TN	MIL-W-81381/10 3/	MV
MT	MIL-W-81381/9 3/	WF	MIL-W-22759/83 3/	MIL-W-22759/28	JB	MIL-W-81381/11 3/	MW
MV	MIL-W-81381/10 3/	WG	MIL-W-22759/84 3/	MIL-W-22759/29	JC	MIL-W-81381/12 3/	MY
MW	MIL-W-81381/11 3/	WH	MIL-W-22759/85 3/	MIL-W-22759/30	JD	MIL-W-81381/13 3/	NA
MY	MIL-W-81381/12 3/	WJ	MIL-W-22759/86 3/	MIL-W-22759/31	JE	MIL-W-81381/14 3/	NB
NA	MIL-W-81381/13 3/	WK	MIL-W-22759/87 3/	MIL-W-22759/32	SB	MIL-W-81381/17 3/	NE
NB	MIL-W-81381/14 3/	WL	MIL-W-22759/88 3/	MIL-W-22759/33	SC	MIL-W-81381/18 3/	NF
NE	MIL-W-81381/17 3/	WM	MIL-W-22759/89 3/	MIL-W-22759/34	SD	MIL-W-81381/19 3/	NG
NF	MIL-W-81381/18 3/	WN	MIL-W-22759/90 3/	MIL-W-22759/35	SE	MIL-W-81381/20 3/	NH
NG	MIL-W-81381/19 3/	WP	MIL-W-22759/91 3/	MIL-W-22759/41	SM	MIL-W-81381/21 3/	NK
NH	MIL-W-81381/20 3/	WR	MIL-W-22759/92 3/	MIL-W-22759/42	SN	MIL-W-81381/22 3/	NL

1/ Not for use in aerospace applications. 2/ Inactive for new design. 3/ Not for Naval Air Systems Command usage.

1.2.1.4 Number of wires per cable. The number of wires per cable will be as designated and will be 1 to 15 for shielded or shielded and jacketed cables, and 2 to 15 for unshielded unjacketed or unshielded jacketed cables. Cables with 10 to 15 conductors will be limited to conductor size 12 and smaller.

1.2.1.5 Shield style and material. The shield style and material of the overall shields will be designated by a single letter in accordance with table IA.

TABLE I A Shield Material

Symbol single shield style	Symbol double shield style	Shield Material	Maximum temperature limit for shield material (information only)
U	---	No shield	---
T	V	Tin-coated copper, round	150°C (302°F)
S	W	Silver-coated copper, round	200°C (392°F)
N	Y	Nickel-coated copper, round	260°C (500°F)
F	Z	Stainless Steel, round	400°C (752°F)
C	R	Heavy Nickel coated copper, round	400°C (752°F)
M	K	Silver-coated high strength copper alloy, round	200°C (392°F)
P	L	Nickel-coated high strength copper alloy, round	260°C (500°F)
G	A	Silver-coated copper, flat	200°C (392°F)
H	B	Silver-coated high strength copper alloy, flat	200°C (392°F)
*	#	Nickel-coated copper, flat	260°C (500°F)
J	D	Tin-coated copper, flat	150°C (302°F)
E	X	Nickel-coated high strength copper alloy, flat	260°C (500°F)
I	Q	Nickel-chromium alloy, flat	400°C (752°F)

1.2.1.6 Jacket material and temperature rating. The single jacket symbol will be used for cables with an outer jacket only. The double jacket symbol will be used in conjunction with a double shield symbol to describe constructions with a jacket in between two shields with another jacket over the outer shield. The single jacket symbol will be used in conjunction with the double shield symbol to describe constructions with two overlaid shields with a single outer jacket. Unless otherwise specified, (see 3.10 and 6.2.1h), jacket colors will be as specified under the jacket materials in accordance with Table I B.

Table I B Jacket materials and color

Single jacket symbol	Double jacket symbol	Jacket material	Temperature limit limit for jacket material (information only)
00	00	No Jacket	---
01	51[1/]	Extruded white polyvinyl chloride (PVC)	90° C (194°F)
02	52[2/]	Extruded clear polyamide in accordance with ASTM D4066	105°C (221°F)
03	53	White polyamide braid impregnated with clear polyamide finisher over a polyester tape	105°C (221°F)
04	54	Polyester braid impregnated with high temperature finishers over polyester tape	150°C (302°F)
05	55	Extruded Clear fluorinated ethylene propylene (FEP)	200°C (392°F)
06	56	Extruded or taped and heat sealed white polytetrafluoroethylene (PTFE)	260°C (500°F)
07	57	White polytetrafluoroethylene (PTFE) treated glass braid impregnated and coated with polytetrafluoroethylene finisher over presintered polytetrafluoroethylene tape	260°C (500°F)
08[3/]	58[3/]	Cross linked white extruded polyvinylidene fluoride (PVF_2)	150°C (302°F)
09	59	Extruded white fluorinated ethylene propylene (FEP)	200°C (392°F)
10[3/]	60[3/]	Extruded clear polyvinylidene fluoride (PVF_2)	125°C (257°F)
11[4/]	61[4/]	Tape of natural polyimide combined with clear fluorinated ethylene propylene (FEP) wrapped and heat sealed with (FEP) outer surface	200°C (392°F)
12[4/]	62[4/]	Tape of natural polyimide combined with fluorinated ethylene propylene (FEP) wrapped and heat sealed with polyimide outer surface	200°C (392°F)
14	64	Extruded white ethylene-tetrafluoroethylene copolymer (ETFE)	150°C (302°F)
15	65	Extruded clear ethylene-tetrafluoroethylene copolymer (ETFE)	150°C (302°F)
16	66	Braid of aromatic polyamide with high temperature finisher over presintered polytetrafluoroethylene (PTFE) tape	200°C (392°F)
17[5/]	67[5/]	White extruded ethylene chlorotrifluoro-ethylene (ECTFE)	150°C (302°F)
18[5/]	68[5/]	Clear extruded ethylene chlorotrifluoro-ethylene (ECTFE)	150°C (302°F)

1/ Polyvinyl chloride materials shall not be used for aerospace applications.
2/ Jacket material 02 is not to be used for cables having a diameter of 0.251 inch (6.88) or greater
3/ Jacket materials 08, 58, 10 and 60 are not to be used for cables having a diameter of 0.401 inch(10.19mm)or greater.
4/ Not for Naval Air Systems Command Usage
5/ Inactive for new design

Table I B Jacket material and color continued;

Single jacket symbol	double jacket symbol	Jacket material	Temperature limit for jacket material (information only)
20	70	Extruded white perfluoroalkoxy (PFA)	260°C (500°F)
21	71	Extruded clear perfluoroalkoxy (PFA)	260°C (500°F)
22	72	Tape of polyimide combined with clear fluorinated ethylene propylene (FEP) wrapped and heat sealed with opaque polyimide outer surface	200°C (392°F)
23	73	White, crosslinked, extruded, modified, ethylene-tetrafluoroethylene copolymer (XLETFE)	200°C (392°F)
24	74	Tape layer of white polytetrafluoroethylene (PTFE) wrapped over a tape layer of natural polyimide combined with FEP and heat sealed.	200°C (392°F)

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 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 of the 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 specification to the extent specified herein. Unless otherwise specified, the issues of these documents will be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

Department of Defense

MIL-W-5086 - Wire, Electrical, Polyvinyl Chloride Insulated, Copper or Copper Alloy.
MIL-W-8777 - Wire, Electrical, Silicone-Insulated, Copper, 600 Volt, 200° C.
MIL-C-12000 - Cable, Cord, and Wire, Electric; Packaging of.
MIL-W-22759 - Wire, Electric, Fluoropolymer-insulated, Copper Or Copper Alloy.
MIL-W-25038 - Wire, Electrical, High Temperature And Fire Resistant, General specification For
MIL-W-81044 - Wire, Electric, Crosslinked Polyalkene, Crosslinked Alkaneimide Polymer, or Polyarylene Insulated Copper Or Copper Alloy.
MIL-W-81381 - Wire, Electric, Polyimide-insulated, Copper or Copper Alloy.

STANDARDS

Department of Defense

MIL-STD-104 - Limits For Electrical Insulation Color.
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
MIL-STD-2223 - Test Methods for Insulated Electric Wire
MS25471 - Wire, Electrical-Silicone, Copper, 600 Volt, 200 Deg. C, Polyester Jacket.
MS27110 - Wire, Electrical-Silicone, Copper, 600 Volt, 200 Deg. C, FEP Jacket.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from Standardization Document Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094).

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

H4-1 - Federal Supply Code For Manufacturers, United States and Canada, Name to Code.
H4-2 - Federal Supply Code For Manufacturers, United States and Canada. Code to Name

(Copies of specifications, standards and other government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

(Applications for copies should be addressed to: Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

2.3. Non Government Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted will be those listed in the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS will be the issue of the non-Government documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 313 - Wire, Steel, Corrosion Resisting
ASTM B 3 - Soft or Annealed Copper Wire.
ASTM B 33 - Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes.
ASTM B 272 - Copper Flat Copper Products with Finished (Rolled or Drawn) Edges (Flat Wire and Strip).
ASTM B 298 - Silver-Coated Soft or Annealed Copper Wire.
ASTM B 355 - Nickel-Coated Soft or Annealed Copper Wire.
ASTM B 624 - High-strength, High-conductivity Copper Alloy Wire for Electronic Application, Standard Specification for.
ASTM D 3032 - Hookup Wire Insulation, Standard Methods of Testing.
ASTM D 4066 - Polyamide Injection and Extrusion Materials (PA).
ASTM F 777 - Standard Test Method for Resistance of Electrical wire Insulation Materials to Flame at 60 Degrees

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, W. Conshohocken, PA. 19428.)

AMERICAN NATIONAL STANDARD

ANSI/ASQC Z 1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to American Society for Quality Control, ASQC, 611 East Wisconsin Avenue, Milwaukee, Wisconsin 53202)

NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY (NIST)

NBS HDBK 100 - International Annealed Copper Standard (IACS)

(Application for copies should be addressed to National Institute for Standards and Technology, Administration Building 101 (Publications Office) Gaithersburg, MD 20879

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.4 Order of precedence. In the event of a conflict between this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification will take precedence. Nothing in this specification, however, will supersede applicable laws or regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials.

3.1.1 Copper shield round strand material. 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 B 3.

3.1.2 Stainless steel shield material. Before shielding, the stainless steel strands shall conform to ASTM A 313, form I, (or form II as applicable) composition 302 or 304, condition A.

3.1.3 High-strength copper alloy shield round strands. Before shielding, the high strength copper alloy strands shall conform to ASTM B 624 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) as stated in NBS Handbook 100.

3.2 Construction. Construction shall comply with the classification given in 1.2. Recommend combinations of shield style, basic wire specification and jacket materials are shown in table II.

3.3 Basic wire. Wire used in the construction of the cable shall be qualified to the basic wire specification (see table I) before cabling. The producer of the finished cable shall be a qualified source under the applicable basic wire specification, or shall be responsible that qualified wire from a qualified source was used in the construction of the cable and be required to furnish on request a test report from the manufacturer of the basic wire, plus a letter certifying that the component wire meets all the individual component wire specification requirements from the builder of the cable. Color added to the insulation (such as a helical stripe or circumferential band) for the purpose of wire number identification shall not degrade the insulation as evidenced by failure to meet the requirements herein. Unless otherwise specified (see 6.2), the manufacturer of cable is responsible for assuring that the basic wire meets the wire specification requirements prior to being fabricated into cable.

3.4 Identification of cable wire. The basic wire insulation for single or multiconductor cables shall be colored to provide a method of determining the wire number. Unless otherwise specified (see 6.2), the preferred identification method (see 3.4.1) shall be used. Stripes, tracers and background insulation colors on the basic wires shall meet the requirements of MIL-STD-104 Class I, unless otherwise indicated or allowed by the basic wire specification

3.4.1 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 accordance with table III A or III B, 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 in accordance with MIL-STD-681 except the stripe color and sequence shall be as specified herein. 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.

3.4.2 Optional identification, method A. The insulation shall be solid color in accordance with table III A or III B, 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.

3.4.3 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 accordance with table III C. In order to identify each wire in the cable, color bands shall be applied in accordance with table III D. Color of the bands shall be a contrasting color to the base color of the insulation. The narrow bands shall be 0.030 inch 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 inch to 0.120 inch apart in a group. Group separation shall be 0.38 to 1.50 inch (9.7 to 38.1 mm). The distance between the beginning of one group and the end of the next group shall be 3.0 inches (76.2 mm) maximum.

3.9.4 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 accordance with table III C. In order to identify each wire in the cable, the use of numbers imprinted on the insulation of the primary wire shall be permitted. 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 (76.2 mm) maximum

3.4.5 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 permitted. 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 (76.2 mm) maximum

3.5 Cable lay-up. The required number of wires for multiconductor construction determined by the cable designation 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 maximum diameter of the unshielded, unjacketed cable as calculated 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.

3.6 Fillers and binder tapes. Fillers and binder tapes, if used shall be of a fungus resistant material with a temperature equivalent to the cable rating with out fillers and tape. They shall also be easily removable from the finished cable without adherence to the underlying insulation.

3.7 Shield. When the cable designation specifies that a shield is to be incorporated in the cable construction, either a closely woven braid using round strand or a closely woven braid of flat strand shall be applied over the basic wire or cable. The shield strands shall be free from lumps, kinks, abrasions, scraped or corroded surfaces and skin impurities. The strand coating shall be smooth, continuous, and adherent to the underlying material.

3.7.1 Braided shields.

3.7.1.1 Braided round wire. Before application to the cable, individual tin, silver, or nickel coated copper strands shall have a minimum elongation of 6 percent.

3.7.1.2 Round copper or copper alloy strand size. Cables with braided shields using round copper or round copper alloy strands shall conform to shield group A or B. 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 diameter multiplied by factor A for filled cables and factor G for unfilled cables from table IV. The following basic wires MIL-W-22759/11, MIL-W-22759/12, MIL-W-22759/16 through MIL-W-22759/19, MIL-W-22759/22, MIL-W-22759/23, MIL-W-22759/28 through MIL-W-22759/35, MIL-W-22759/41 through MIL-W-22759/46, MIL-W-22759/80 through MIL-W-22759/92 and all specification sheets of MIL-W-81381 and MIL-W-81044, shall conform to shield group B. All other braided shields with round shields strands shall conform to shield group A.

Group A Cable Core Diameter.	Group B Cable Core Diameter.	Shield Strand Size
.000 to .060 inch	.000 to .250 inch	38 AWG
.061 to .310 inch	.251 to .400 inch	36 AWG
.311 to .750 inch	.401 to 1.00 inch	34 AWG
.751 inch and larger	1.001 inches and larger	32 AWG

3.7.1.3 Round shield strand Coating.

3.7.1.3.1 Tin-coated copper strands. When the cable designation specifies a tin-coated shield, the individual strands shall be coated uniformly with a smooth continuous layer of commercially pure tin. Prior to braiding, strands shall meet the requirements of ASTM B33. The thickness of the tin coating shall be 250 microinches maximum.

3.7.1.3.2 Silver-coated copper and high strength 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 3.1.3 and the adhesion and continuity of coating requirements of ASTM B298. The thickness of the silver shall not be less than 40 microinches.

3.7.1.3.3 Nickel-coated copper and high strength 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 nor greater than 250 microinches. The 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 3.1.3 and the adhesion and continuity of coating requirements of ASTM B 355.

3.7.1.3.4 Heavy nickel coated copper strands. When the cable designation specifies a nickel coated copper shield, the individual strands shall have a nickel coating having a cross-sectional area that is 27 percent minimum of the total cross-sectional area of the drawn strand. The wire shall meet the coating requirements of ASTM B355 prior to braiding.

3.7.1.4 Stainless steel shield.

3.7.1.4.1 Stainless steel strand size. On cable with the outside diameter (under the shield) of less than 0.060 inch (1.52 mm), the strand size shall be AWG 40. On cable with an outside diameter of 0.060 to 0.120 inch (3.05 mm), the strand size shall be AWG 38. On cable with outside diameter of 0.121 inch (3.07 mm) and larger, the strand size shall be AWG 36.

3.7.1.5 Braided flattened wire strands. Flat wire shields shall be braided of copper, high-strength copper alloy, or nickel alloy. The flattened wire shall be 0.0015 inch ± 0.0004 inch (0.040 ± 0.010 mm) in thickness.

3.7.1.5.1 Copper wire, flattened. Copper flattened wire shall meet the requirements of ASTM B272 except the wire shall be made by flattening round wire.

3.7.1.5.2 Flattened high strength copper alloy flat wire. Flattened high strength copper alloy wire shall be made by flattening round wire. The flattened wire tensile strength shall be not less than 55,000 lbf/in^2 and the elongation shall be one (1) percent minimum after flattening.

3.7.1.6 Coating of flattened wire strands.

3.7.1.6.1 Tin-coated copper flattened wire. Tin-coated copper strands before flattening shall conform to ASTM B33. Flattened wire strands shall meet the continuity of coating test of ASTM B33. The thickness of the coating shall be 250 microinches maximum.

3.7.1.6.2 Silver-coated copper or Silver-coated high strength copper alloy flattened wire. Silver-coated copper or silver-coated high strength copper alloy strands before flattening shall conform to ASTM B298 Flattened wire strands shall meet the continuity of coating requirements of ASTM B298. The thickness of coating shall be 40 microinches minimum after flattening.

3.7.1.6.3 Nickel-coated copper or Nickel-coated high strength copper alloy flattened wire. Nickel-coated copper or nickel-coated high strength copper alloy strands before flattening shall conform to ASTM B355. Flattened wire strands shall meet the continuity of coating requirements of ASTM B355. The thickness of coating shall be 50 microinches minimum after flattening.

3.7.2 Braid angle. The shield braid shall be a push-back type. The angle of the carriers of the braid with the axis of the cable in woven wire shields shall be not less than 18° nor more than 40°. When the maximum calculated outer diameter (see 4.4) of the cable beneath the braid is greater than 0.31 inches (7.9 mm), the above braid angle restriction shall not apply. In this case, the shield shall be suitably applied to provide good push-back characteristics. For determination of braid angle, see 4.3.5.

3.7.3 Shield coverage. The shield braid shall be applied in such a manner as to provide 85 or 90 percent minimum coverage for each individual shield (see 4.3.5) as specified by the part number (see 1.2.1.1).

3.7.4 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.

3.7.5 Jacket. When a jacket is applied over a cable or shield, all jackets shall meet the following requirements. The jacket shall be easily removable from the finished cable without adherence to the underlying shield or cable. Stripping time (for jacket styles 11, 12, and 22 only) shall be 5 seconds maximum when testing in accordance with 4.3.15 and shall not open more than 0.125 inch (3.18 mm). The wall thickness of the jacket shall be as specified in table V for applicable material. The thickness of the jacket between the shields in the double shield and double jacket shall be 75 percent of the values specified in table V.

3.7.5.1 Jacket material.

3.7.5.1.1 Extruded clear polyamide. Extruded polyamide jackets shall be limited in application to cables having a maximum calculated outer diameter (see 4.4) not greater than 0.25 inch (6.4 mm) prior to application of jacket. Extruded polyamide jackets shall be applied concentrically and shall have a wall thickness in accordance with table V. The polyamide shall be in accordance with ASTM D 4066 type PA 0621E22.

3.7.5.1.2 White polyamide braid and polyamide finishers. Jackets shall be constructed with white polyamide fibers, 210 denier, woven in such a manner as to provide complete coverage, when viewed with the unaided eye, and shall be impregnated with a clear polyamide finisher.

3.7.5.1.3 Polyester fiber braid with high temperature finishers. Braided polyester fiber jackets shall be constructed with the fiber woven in such a manner as to provide complete coverage, when viewed with the unaided eye, and shall be impregnated with a high temperature finisher. The color of the finished braids shall be white or tan. After subjection to the heat aging test, the finisher shall show no indications of decomposition.

3.7.5.1.4 Extruded or taped polytetrafluoroethylene. Concentrically extruded or taped polytetrafluoroethylene jackets shall have a wall thickness in accordance with table V (see 4.3.13). If polytetrafluoroethylene tapes are used, they shall be unsupported and shall be a minimum of two contrahelically wrapped tapes each applied with a 25 percent minimum overlap. The tapes shall subsequently be heat sealed, and shall meet the requirements of 4.3.17.1. The polytetrafluoroethylene jackets shall be white.

3.7.5.1.5 Extruded white polyvinyl chloride. Extruded polyvinyl chloride jackets shall be colored white and shall have wall thickness in accordance with table V (see 4.3.13). The tensile strength and elongation of the jacket shall be 2000 lb_f/in^2 minimum and 150 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1. Polyvinyl chloride shall not be used for aerospace purposes.

3.7.5.1.6 Extruded fluorinated ethylene propylene. Jackets shall be constructed of a clear or white fluorinated ethylene propylene as indicated by the style and shall be concentrically extruded with a thickness in accordance with table V. The tensile strength and elongation of the jacket shall be 3000 lb_f/in^2 minimum and 200 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.7 Glass braid with polytetrafluoroethylene finishers. Braided polytetrafluoroethylene coated glass fiber jackets shall be constructed with treated glass fiber containing not less than 15 percent by weight of polytetrafluoroethylene and woven in a manner that will provide complete coverage. The braid shall be impregnated and coated with a polytetrafluoroethylene finisher.

3.7.5.1.8 Extruded crosslinked polyvinylidene fluoride. Jackets of extruded and crosslinked polyvinylidene fluoride shall be in accordance with table V. The tensile strength and elongation of the jacket shall be 4000 lb_f/in^2 minimum and 200 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.9 Polyvinylidene fluoride. These jackets shall be extruded of clear polyvinylidene fluoride. The tensile strength and elongation of the jacket shall be 5000 lb_f/in^2 minimum and 225 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.10 Taped polyimide/fluorinated ethylene propylene. The jackets of polyimide/fluorinated ethylene propylene tapes shall consist of two or more tapes. The inner tape shall be a one-side polyimide/fluoropolymer coated tape applied with not less than 20 percent overlap and with the polyimide side facing the shield or component wires. Succeeding tapes shall be applied in alternating directions and with not less than 30 percent overlap. The tapes shall be thermally sealed together to provide a jacket with a wall thickness in accordance with table V.

3.7.5.1.11 Ethylene-tetrafluoroethylene copolymer. These jackets shall be extruded ethylene-tetrafluoroethylene copolymer and shall have a wall thickness as shown in table V. The tensile strength and elongation of the jacket shall be 5000 lb_f/in^2 minimum and 150 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.12 Ethylene chlorotrifluoroethylene copolymer. (Inactive for new design). Jackets of ethylene chlorotrifluoroethylene copolymer shall have a wall thickness as shown in table V. The tensile strength and elongation of the jacket shall be 5000 lb_f/in^2 minimum and 150 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.13 Extruded perfluoroalkoxy. Jackets of extruded perfluoroalkoxy shall have a wall thickness as shown in table V. The tensile strength and elongation of the jacket shall be 3000 lb_f/in^2 minimum and 150 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1.

3.7.5.1.14 Extruded, crosslinked, modified, ethylene-tetrafluoroethylene. Jackets of extruded, crosslinked, modified, ethylene-tetrafluoroethylene shall have a wall thickness as shown in table V. The color shall be white. The tensile strength and elongation of the jacket shall be 5000 lb_f/in^2 minimum and 50 percent minimum, respectively, and shall be tested in accordance with 4.3.13.1. The XLETFE material shall be formulated in such a manner to achieve a minimum 62% contrast level when marked by a UV laser source in accordance with 3.8.13.

3.7.5.1.15 Taped Polyimide/Polytetrafluoroethylene. The jackets of Polyimide/Polytetrafluoroethylene shall consist of two tapes. For constructions requiring an 0.006 to 0.010 inch jacket thickness, the inner tape shall be a fluoropolymer/polyimide/fluoropolymer coated tape (1 mil minimum thickness) applied with a minimum 50 percent overlap. The outer tape shall be an unsintered polytetrafluoroethylene (PTFE) tape (2 mil thickness) applied in the opposite direction to the first tape and with a minimum of 50 percent overlap. For constructions requiring an 0.008 to 0.012 inch jacket thickness, the 2 mil outer PTFE tape shall have a minimum overlap of 67%. The tapes shall be heat sealed after wrapping. The PTFE tape material shall be formulated in such a manner to achieve a minimum 62% contrast level when marked by a UV laser source in accordance with 3.8.13.

3.7.6 Concentricity of extruded jackets. The concentricity of extruded jackets shall not be less than 70 percent when tested in accordance with 4.3.16.

3.8 Functional Characteristics.

3.8.1 Dielectric withstand.

3.8.1.1 Dielectric withstand - Component wire. One hundred percent of all finished cable shall be tested in accordance with 4.3.3.1. During this test, there shall be no evidence of electrical breakdown or arcing.

3.8.1.2 Dielectric withstand - Inner jacket. One hundred percent of all finished cable with inner jackets shall be tested in accordance with 4.3.3.2 During this test, there shall be no evidence of electrical breakdown or arcing.

3.8.1.3 Impulse dielectric (for unshielded/unjacketed configuration). One hundred percent of all finished unshielded and unjacketed, multi-conductor cable (except MIL-W-8777 and MIL-W-25038), 2-7 conductors, sizes 14-26 AWG and 2-5 conductors, size 12 AWG, shall pass the impulse dielectric test in accordance with 4.3.3.3. There shall be no evidence of dielectric failure.

3.8.2 Jacket flaws (shielded and jacketed cables only). One hundred percent of all finished cable shall be tested in accordance with 4.3.4 All flaws shall be removed or marked consistent with the requirements for packaging (see 5.1).

3.8.3 Conductor continuity. All conductors in all lengths of finished cable shall withstand the conductor continuity test of 4.3.8 without indication of discontinuity.

3.8.4 Cold bend (jacketed and shielded-and-jacketed cables only). All finished jacketed and shielded-and-jacketed types of cable shall withstand the cold bend test of 4.3.6 without evidence of cracking of jackets. Shielded and jacketed cable with jacket material listed in 4.3.6 shall then pass the voltage withstand test of 4.3.7 without electrical breakdown.

3.8.5 Thermal shock. All finished cable with jacket materials listed in table VI shall withstand the thermal shock test of 4.3.9 without cracking of the jacket.

3.8.6 Aging stability. All finished cable with jacket styles listed in table VI shall withstand the aging stability test of 4.3.10 without cracking of the jacket.

3.8.7 Blocking. Adjacent layers of cable with all jacket materials shall not stick together nor to the metal mandrel when subjected to the test for blocking in 4.3.15 at rated temperature of the jacket or basic wire, whichever is lower, for 6 hours.

3.8.8 Flammability. Cable specimens with all jacket materials loaded with sufficient weight to remain taut throughout test shall not burn for more than 30 seconds, nor more than 3.0 inches (76.2 mm) when tested in accordance with 4.6.

3.8.9 Lamination sealing. Cable specimens with tape wrapped jacket materials 11, 12, 22, 24, 61, 62, 72 or 74 shall exhibit no separation of layers either along the insulation or at the ends when tested in accordance with 4.3.14.

3.8.10 Crosslinked verification. All finished cable with jacket material 08, 23, 58, and 73 shall withstand the test of 4.3.10 without cracking of the jacket or dielectric breakdown, as applicable (see 4.2). Normal oxidation of the conductor coating or shield strand coating shall not be cause for rejection.

3.8.11 Shield solderability. Solderability shall be evaluated using the "Evaluation of Wrapped Lugs, Tabs, and Wire" paragraph of MIL-STD-202, Method 208 after the braided shields are tested in accordance with paragraph 4.3.18. The requirement is applicable to tin and silver coated shields only (single shield symbols T, S, M, G, H, J, and double shield symbols V, W, K, A, B, D).

3.8.12 Temperature rating. The temperature rating of the cable shall be defined as the lowest rating of the basic specification wire, shield material, or jacket material as defined in 1.2.1.5 or 1.2.1.6.

3.8.13 Laser Markability. Applicable materials shall be formulated in such a manner to achieve a 62 % minimum contrast level when marked by an Ultraviolet (UV) laser source operating at a delivered power not to exceed 1.5 Joules/cm^2. The contrast level is defined as the difference between the reflectances of the background insulation and the laser mark, divided by the reflectance of the background insulation.

3.9 Identification of product.

3.9.1 Cable product identification. The cable product identification shall consist of the cable designation as determined by 1.2.1 and the cable manufacturer's code designation in accordance with publication H4-1 and H4-2. No other identification marking shall be applied by the manufacturer.

3.9.1.1 Unshielded, unjacketed cable, shielded singles, and shielded and jacketed singles. The cable product identification shall be imprinted on the insulation of wire number 1 (see 3.9.2) except on shielded and jacketed single constructions having jacket styles 08, 23, 58, and 73, which shall have the cable product identification marked on the surface of the jacket. The cable product identification shall conform to paragraph 3.9.3. The cable product identification shall not be required on the insulation of wire number 1 when the product identification is not required by the basic wire specification for that size wire.

3.9.1.2 Shielded cable (2 to 15 wires). The cable product identification shall be imprinted on a marker tape placed beneath the shield (see 3.9.4).

3.9.1.3 Jacketed cable (2 to 15 wires). The cable product identification shall be imprinted on the outer surface of the following jacket styles 08, 23, 58, and 73. All other jacket styles shall have cable product identification imprinted on a marker tape placed beneath the jacket (see 3.9.4).

3.9.1.4 Shielded and jacketed cable (2 to 15 wires). The cable product identification shall be imprinted on the outer surface of the following jacket styles, 08, 23, 58, and 73. All other jacket styles shall have cable product identification imprinted on a marker tape placed beneath the shield or jacket.

3.9.2 Wire product identification. The wire product identification shall appear on all individual basic wires when required by the basic specification. The wire product identification may be omitted on wire number 1 when this wire carries the cable product identification (see 3.9.1.1).

3.9.3 Cable Product Identification The cable product identification shall not be applied by hot stamp or any other method which reduces the insulation and/or jacket thickness at the point of the mark. The printed marking shall be durable, legible, and shall be black in color, except where black is difficult to read or is the color of the insulation, in which case the color of the printing shall be white (see 3.4 and 3.9.1.1). The size of the printed characters shall be consistent with the magnitude of the surface upon which it is printed. The distance between the end of one marker and the beginning of next shall be:

a. 6 to 18 inches if printed on the jacket (see 3.9.1.1, 3.9.1.3, and 3.9.1.4).

b. A maximum of 3 inches if on a marker tape (see 3.9.1.2, 3.9.1.3, and 3.9.1.4).

c. A maximum of 12 inches if on wire number 1 (see 3.9.1.1)

The printed marking shall be applied with the vertical axis of the printed characters lengthwise on cable (or wire) whose nominal diameter is 0.050 inch (1.27 mm) or smaller. The vertical axis of the printed characters may be crosswise or lengthwise on cable (or wire) whose nominal diameter is 0.051 inch (1.30 mm), or larger, or whenever tape is used (see 3.9.4).

3.9.4 Identification tape. When tape is used for carrying the imprinted cable product identification, the tape shall be one continuous length of electrically nonadhesive type material with a temperature rating equivalent to the cable rating. The color of the tape shall be white except when polyimide tape is used, in which case the natural color of the polyimide is acceptable.

3.10 Jacket color. Unless otherwise specified in the contract or purchase order (see 6.2), the cable jacket color shall be in accordance with the jacket material descriptions of 1.2.1.6 and shall conform to MIL-STD-104.

3.11 Cable diameter. The major diameter of the cable shall be determined as specified in 4.4 and shall not exceed the maximum diameter calculated in accordance with 4.4.

3.12 Cable weight. The maximum weight of the cable shall be determined as specified in 4.5. The measured weight shall not exceed the calculated weight.

3.13 Continuous lengths. When inspected in accordance with paragraph 4.7, the individual continuous lengths of finished cable in each inspection lot shall conform to the continuous length requirements listed below:

85 % of the lengths shall be greater than 100 feet.
100 % of the lengths shall be greater than 50 feet.

Unless otherwise specified in the contract or order, the footage of the individual continuous lengths in each spool or reel shall be marked on the spool or reel in the sequence in which the lengths will be unwound by the user.

3.14 Workmanship. The finished cable shall exhibit uniform quality throughout, without visible irregularities when viewed with the unaided eye.

TABLE II. Allowable shield and jacket materials for each basic type wire.

(Note: All shield styles, and jacket constructions as listed in Table 1A and Table 1B are applicable to this table.)

Cable type						
Basic Wire Specification	Shielded		Jacketed		Shielded and jacketed	
	Shield Material 1/	Jacket material	Shield material	Jacket material	Shield material	Jacket material
MIL-W-5086	T	00	U	01, 02, 03, 10	T	01, 02, 03, 10
MIL-W-8777	S	00	U	04	S	04
MIL-W-25038/1 & /3	F, C	00	U	06, 07	F, C	06, 07
MIL-W-81044	T, S	00	U	04, 08, 09, 14, 16, 23	T, S	04, 08, 09, 14, 16, 23
MIL-W-81381	T, S, N	00	U	05, 09, 11, 12, 22	T, S, N	05, 09, 11, 12, 22
MIL-W-22759 slash sheets 1-12, 20-23, 28-31	T, S, N	00	U	04, 05, 06, 07, 09, 14-18, 20, 21	T, S, N	04, 05, 06, 07, 09, 14-18, 20, 21
MIL-W-22759 slash sheets 13 - 19	T, S, N	00	U	04, 05, 09, 14-18, 20, 21	T, S, N	04, 05, 09, 14-18, 20, 21
MIL-W-22759 slash sheets 32 -35, 41 - 46	T, S, N	00	U	04, 05, 08, 09 14 -18, 20, 21, 23, 24	T, S, N	04, 05, 08, 09 14-18, 20, 21, 23, 24
MIL-W-22759 slash sheets 80 - 92	T, S, N	00	U	04, 05, 06, 07, 09, 11, 12, 14-18 20, 21, 22, 24	T, S, N	04, 05, 06, 07, 09, 11, 12, 14-18 20, 21, 22, 24

80=can bus ?

1/ Material Code : T – Tin
S – Silver
N – Nickel
F – Stainless Steel
C – Heavy Coated Nickel

TABLE III A. Circuit identification colors for basic wires in accordance with MIL-W-22759, MIL-W-25038, MIL-W-81044 or MIL-W-81381.

No. of wires in cable	Identification colors for respective wires in cable (see 3.4.1 or 3.4..2)														
	Wire number														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Basic (white)														
2	White 1/	Blue													
3	White 1/	Blue	Orange												
4	White 1/	Blue	Orange	Green											
5	White 1/	Blue	Orange	Green	Red										
6	White 1/	Blue	Orange	Green	Red	Black									
7	White 1/	Blue	Orange	Green	Red	Black	Yellow /2								
8	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet							
9	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray						
10	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	4/				
11	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	Blue/Blue	4/			
12	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	Blue/Blue	Orange/Orange	4/		
13	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	Blue/Blue	Orange/Orange	Green/Green	4/	
14	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	Blue/Blue	Orange/Orange	Green/Green	Red/Red	4/
15	White 1/	Blue	Orange	Green	Red	Black	Yellow /2	Violet	Gray	Brown 3/	Blue/Blue	Orange/Orange	Green/Green	Red/Red	Black/black

1/ Except where preferred color on basic wire specification sheet is not white
2/ Where basic wire is MIL-W-81381, a brown helical stripe shall be used.
3/ Where basic wire is MIL-W-81381, a brown and white helical stripes shall be used
4/ For cables having more than 10 conductors the wires shall be identified by double tracers. (Blue/Blue indicates a white base wire with double blue tracers)

TABLE III B. Circuit identification colors for basic wires in accordance with MIL-W-5086, MIL-W-8777, MIL-W-22759, MIL-W-25038, MIL-W-81044 or MIL-W-81381 1/

No. of wires in Cable	Identification colors for respective wires in cable (see 3.1.1.1.1 or 3.1.1.1.2)
1	Basic (white)
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 2/
12	Red, blue, yellow, green, basic, black, brown, orange, violet, gray, red/ white, blue/white 2/
13	Red, blue, yellow, green, basic, black, brown, orange, violet, gray, red/ white, blue/white, yellow/white 2/
14	Red, blue, yellow, green, basic, black, brown, orange, violet, gray, red/ white, blue/white, yellow/white, green/white 2/
15	Red, blue, yellow, green, basic, black, brown, orange, violet, gray, red/ white, blue/white, yellow/white, green/white, black/white 2/

1/ Inactive for new design for MIL-W-5086.
2/ Color designation indicates a solid color with stripe, (red/white - solid red insulation with a white stripe)

TABLE III C. Color of insulation for identification of wire sizes (see 3.1.1.1.3), in accordance with MIL-STD-686.

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

1/ 26 AWG is inactive for new design.
2/ For MIL-W-81381 basic wire, the insulation color may be opaque dark yellow or unpigmented polymide resin color.

TABLE III D. Circumferential band configuration for wire number identification (see 3.1.1.1.3).

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

TABLE IV. 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 4.3.4 and 4.4).
2/ Geometry factor for cable weight calculation (see 4.5)
3/ Geometry factor for unfilled cables (see 4.3.10 and 3.7.1.2)

TABLE V. Jacket wall thickness.

iameter of cable beneath jacket (inches)	Jacket Material Designation 1/								
	01	02	06	05, 09, 14 15, 17, 18 20, 21	08, 10	11	12, 22	23	24
Up to 0.150	0.010 to .020	0.005 to .009	0.010 to .015	0.007 to .015	0.005 to .010	0.0035 to .0055	0.003 to .0055	0.005 to .010	0.006 to 0.010
0.151 to 0.200	0.015 to .025	0.006 to .010	0.010 to .015	0.010 to .020	0.006 to .012	0.0035 to .0055	0.003 to .0055	0.006 to .011	0.006 to 0.010
0.201 to 0.250	0.020 to .030	0.007 to .011	0.010 to .015	0.010 to .020	0.007 to .014	0.0035 to .0055	0.003 to .0055	0.007 to .012	0.006 to 0.010
0.251 to 0.300	0.025 to .035		0.010 to .015	0.010 to .020	0.007 to .014	0.0035 to .0055	0.003 to .0055	0.007 to .013	0.006 to 0.010
0.301 to 0.400	0.030 to .040		0.015 to .025	0.013 to .020	0.007 to .014	0.006 to .009	0.0045 to .0075	0.008 to .014	0.006 to 0.010
0.401 to 0.500	0.040 to .050		0.015 to .025	0.013 to .020		0.006 to .009	0.0045 to .0075	0.009 to .017	0.006 to 0.010
.0501 to 0.600	0.050 to .065		0.020 to .030	0.020 to .030		0.0095 to .0135	0.007 to .011	0.010 to .018	0.008 to 0.012
.0601 to 0.700	0.060 to .075		0.020 to .030	0.020 to .030		0.0095 to .0135	0.007 to .011	0.012 to .022	0.008 to 0.012
.0701 to .0750	0.070 to .085		0.020 to .030	0.020 to .030		0.0095 to .014	0.007 to .011	0.014 to .024	0.008 to 0.012
0.751 to 0.800	0.075 to .090		0.020 to .030	0.020 to .035		0.0095 to .014	0.007 to .011	0.014 to .024	0.008 to 0.012
0.801 to 1.000	0.080 to .095		0.020 to .030	0.020 to .035		0.0095 to .014	0.007 to .011	0.016 to .030	0.008 to 0.012
Over 1.000	10 - 12.5 % of iameter of cable beneath jacket		0.020 to .030	0.020 to .035				0.020 to .040	0.008 to 0.012

1/ Jacket materials not shown shall have a minimum wall thickness of .010 inch

TABLE VI. Thermal shock and aging stability.

Jacket Materials	Thermal shock and aging stability temperature
01	136°C
02, 03, 04, 10	150°C
14, 15,17, 18	180°C
05, 09, 11, 12, 16, 22, 24	230°C
06, 07, 20, 21	285°C

4. VERIFICATION.

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

a. Quality conformance inspection (see 4.2.1).
b. Process control tests (see 4.2.2).

4.2 Inspection conditions. Unless otherwise specified , all inspections shall be performed in accordance with the test conditions specified in MIL-STD-2223. .

4.2.1 Quality conformance inspection . Quality conformance tests shall consist of the tests listed in table VII.

TABLE VII. Quality conformance inspection.

Test	Requirement	Test Method
Cable Lay-up 1/	3.5	4.2
Shield Coverage 1/	3.7.3	4.3.5
Braid angle 1/	3.7.2	4.3.5
Identification of product	3.9	4.3.1
Jacket wall thickness and Concentricity 1/	3.7.5 & 3.7.6	4.3.13 & 4.3.16
Cable jacket removability 1/	3.7.5	4.3.17
Cable diameter	3.11	4.4
Cable weight	3.12	4.5
Lamination sealing 1/	3.8.9	4.3.14
Cold bend 1/	3.8.4	4.3.6
Thermal Shock 1/	3.8.5	4.3.9
Aging stability 1/	3.8.6	4.3.10
Jacket, tensile strength 1/	3.7.5.1	4.3.13.1
elongation	3.8.7	4.3.15
Blocking 1/	3.8.8	4.6
Flammability 1/	3.8.10	4.3.11
Crosslinked verification1/	3.8.11	4.3.18
Shield solderability 1/		

1/When required

4.2.1.1 Lot. A lot shall consist of all cable of a single cable designation offered for inspection at one time except that the lot shall not exceed 1,000,000 feet or one week's production, whichever is less. The lot shall be expressed in units of thousands of feet (total footage in lot divided by 1,000).

4.2.1.2 Sample. A sample shall consist of individual lengths of cable chosen at random from any one lot for the purpose of inspection or test. The sample size or number of lengths to be chosen from each lot shall be determined by the sampling plan.

4.2.1.3 Sample unit. A sample unit shall consist of one of the individual lengths of the sample. Each sample unit shall be of sufficient length to permit the performance of all applicable inspections or tests.

4.2.1.4 Specimen. A specimen shall consist of a piece of one sample unit upon which a particular inspection or test is to be made.

4.2.1.5 Sampling A random sample of the size specified shall first be selected from the lot. A specimen of sufficient length shall then be selected from each sample unit for the specified tests. Sampling inspection shall be in accordance with ANSI/ASQC Z1.4, inspection level S-4, acceptance number 0 (single sampling plan).

4.2.1.6 Resubmitted inspection lots. ANSI/ASQC Z1.4 shall apply except that a resubmitted lot shall be inspected by the contractor using tightened inspection. Before resubmitting, full particulars concerning the cause of previous rejection and the action taken to correct the defects found in the lot shall be furnished by the contractor to the acquiring activity.

4.2.2 Process control tests. The process control tests are either of such nature that they cannot be performed on finished cable submitted for inspection and therefore must be conducted at the most appropriate stage of manufacturing operation, or they are tests conducted on 100 percent of the finished cable. The process control tests shall consist of the tests listed in table VIII.

TABLE VIII. Process control test.

Test	Requirement	Test Method
Copper shield round strand material 1/	3.1.1	4.3.1
Stainless steel shield material 1/	3.1.2	4.3.1
High-strength copper alloy shield round strand material 1/	3.1.3	4.3.1
Thickness of shield strand coating 1/	3.7.1.3 and 3.7.1.6	4.3.2.2.1
Continuity of shield strand coating 1/	3.7.1.3 and 3.7.1.6	4.3.2.2.2
Shield Strand elongation 1/	3.7.1.1	4.3.2.1
Dielectric withstand component wires (100%) 1/	3.8.1.1	4.3.3.1
Dielectric withstand inner jacket (100%) 1/	3.8.1.2	4.3.3.2
Impulse dielectric 1/	3.8.1.3	4.3.3.3
Jacket flaws (100%100% 1/	3.8.2	4.3.4
Conductor continuity (100%)	3.8.3	4.3.8
Basic wire acceptance	3.3	Basic wire specification
Continuous lengths (100%)	3.13	4.7

1/ When required.

4.2.2.1 Sampling for process control tests.

4.2.2.1.1 Shield strand material. From each week's production of individual shield strands or from every 100 pounds of individual shield strand, whichever is less, three 10-foot lengths of each style of shield strand representative of the material to be used in the finished cable shall be selected.

4.2.2.1.2 Coating. A sample shall consist of at least 3.5 feet of strand, before braiding, that is representative of the strand to be used in each lot of finished cable (see 4.2.1.1).

4.2.2.1.3 Coated copper strand elongation. A sample shall consist of at least 3.5 feet of strand, before braiding, that is representative of the strand to be used in each lot of finished cable (see 4.2.1.1).

4.2.2.1.4 Basic wire. Sampling of the basic wire shall be in accordance with the sampling plan of the basic wire specification. Additional impulse dielectric testing in accordance with the basic wire specification shall be performed when potentially degrading operation, either thermal, mechanical, or chemical have been performed subsequent to the original test.

4.2.3 Rejection and retest. When the sample selected from a production run fails to meet the specified tests, no items still on hand or later produced shall be accepted until the extent and cause of failure have been determined. After investigation, the contractor shall advise the acquiring activity of the action taken and after corrections have been made, all process control tests shall be repeated.

4.2.3.1 Tests may continue. For production reasons, testing may be continued pending the investigation of the process control sample failure but final acceptance requirements of the material shall not be made until it is determined that the lot meets all the requirements of the specification.

4.3 Methods of inspection.

4.3.1 Inspection of product. All samples of cable shall be carefully inspected for all requirements of this specification not covered by tests to ascertain conformance to this specification.

4.3.1 Shield strands.

4.3.2.1 Elongation. Elongation tests on the coated copper strand shall be conducted in accordance with MIL-STD-2223 , method 5002 , using a 12-inch specimen, 10-inch bench marks, and a 10-inch initial jaw separation. The test shall be run on 3 specimens.

4.3.2.2 Coating.

4.3.2.2.1 Thickness. The thickness of the coating shall be determined by the electronic determination method of ASTM B298 or ASTM B355.

4.3.2.2.2 Continuity of tin, silver, and nickel coating. Continuity of tin, silver, and nickel coating tests shall be conducted in accordance with ASTM B 33, ASTM B 298, or ASTM B 355, as applicable. There shall be no evidence of exposed copper.

4.3.3 Dielectric withstand.

4.3.3.1 Dielectric withstand-component wires. The finished cable shall be tested in accordance with MIL-STD-2223, method 3005 , except that immersion is not required. Each conductor, in turn, shall be tested against all others tied together with the (inner) shield (if any). The test voltage shall be 1,500 V rms for 600-volt rated basic wire and 2,500 V rms for 1,000 volt rated basic wire. The time of electrification shall not be less than 15 and not more than 30 seconds.

4.3.3 2 Dielectric withstand-inner jacket. The inner jacket of a double shielded cable shall be subjected to a dry dielectric test. A potential of 500 V rms shall be applied to the inner shield with the outer shield grounded. The time of electrification shall not be less than 15 and not more than 30 seconds.

4.3.3.3 Impulse dielectric test (for unshielded/unjacketed cable configuration. The impulse dielectric test shall be performed in accordance with MIL-STD-2223, method 3002. The test voltage shall be 6 kV (peak).

4.3.4 Jacket flaws. One-hundred percent of all finished shielded and jacketed cable shall be tested in accordance with MIL-STD-2223, method 3001 or 3008, with a minimum potential voltage of 1500 volts AC between the electrode and the cable shield..

4.3.5 Braid angle and shield coverage. The braid angle and the percent coverage of the braid shall be determined by the following formula.

1. $\text{Tan } \alpha = 2 \Pi (D + 2d_1) P/C$
2. If "F" is less than 1, coverage is determined by $K = 100 (2F-F^2)$
3. If "F" is greater than 1, then K= 100%

Where:

K = percent coverage
F = $Epd_2/\sin \alpha$
P = picks per inch of cable length
α = angle of braid with axis of cable
E = number of strands per carrier
d_1 = diameter of one of the round shield strands or thickness of flattened strand
d_2 = diameter of one of the round shield strands or width of flattened strands
D = diameter of cable under shield, nominal
D = Gb (for cables with no fillers, cable factor from column G of table IV)
D = Ab (for cables with fillers to round, use cable factor A of table IV)
C = number of carriers
n = number of basic wires (see table IV)
b = basic wire diameter

Slide the test specimen of braid over a mandrel which has a diameter equal to the nominal diameter (D) of the braid (if no mandrel exists then take care to ensure the braid diameter is formed as close to the nominal diameter as possible.) Determine the quantity P by counting the number of picks over a given length of braid. Determine n/C by counting the number of ends on a single carrier. Determine C by counting the number of carriers on the braid. Find the value of d_1 and d_2 by measuring the strands with a micrometer. These will be equivalent for round strands. Calculate the braid angle α using equation 1. Using the braid angle, calculate the value of F Depending on the value of F, calculate the value the shield coverage using either equation 2 or 3.

4.3.6 Cold Bend. The ends of previously untested samples of finished cable shall be secured to a mandrel in a cold chamber. The other end of each specimen shall be secured to separate load weights sufficient to keep the cable vertical and tangent to the mandrel during the bending operation. The mandrel size shall be as specified in table IX. The temperature of the chamber shall be lowered to -55^0 C ± 5^0 C at a rate not to exceed 50^0 C per minute. The specimen and the mandrel shall be conditioned at this temperature for 4 hours. At the end of this period, and while both mandrel and specimen are still at this low temperatures, the cable shall be wrapped around the mandrel for 180^0 without opening the chamber. The time required for bending around 180^0 of the mandrel shall be one-half minute at a uniform rate of speed. A revolving mandrel operated externally from the chamber shall be used. The specimens shall then be removed from the mandrel and visually inspected, without magnification, for cracks. Specimens of shielded and jacketed types of cable with jacket material 01, 02, 05, 06, and 08 through 12, 14 through 18, 20, 22, 23 and 24 and equivalent double jackets shall be subjected to the voltage withstand test specified in 4.3.6. After being subjected to the cold bend test or voltage withstand test of the jacket, all specimens shall be dissected. The individual wires shall then be immersed within 3 inches of their ends for 1 hour in a 5 percent salt solution. At the end of this period, a potential of 1000 V rms at commercial frequency shall be applied for 1 minute from each conductor to the salt solution.

4.3.7 Voltage withstand, jacket. Specimens shall be formed into the shape of a U. All conductors shall be electrically connected together with the shields (if any) on both ends of the specimen. The specimens shall be tested in accordance with MIL-STD-2223, method 3005 , except the time of immersion shall be 1 hour minimum. The test voltage shall be 1,000 V rms, and the time of electrification shall be 1 minute. The test voltage shall be applied between the conductors (plus shield) and the immersion liquid.

4.3.8 Conductor continuity. Each basic wire in 100 percent of all finished cable in shipment reels or coils shall be tested for conductor continuity with an ohmmeter or other suitable testing device. There shall be no indication of discontinuity.

4.3.9 Thermal shock. Specimens of finished cable with jacket materials listed in table VI shall be wrapped around a mandrel for at least six close turns with the ends of the specimens tied to the mandrel. The mandrel diameter shall be as specified in table IX. The specimens on the mandrel shall be subjected to a temperature within ± 5^0 C of the values specified in table VI for 4 hours, except for jacket material 02 which will be tested for 30 minutes. At the end of this period, the specimen shall be inspected visually for cracks, without the aid of magnification (see 3.8.5).

4.3.10 Aging stability. Specimens of finished cable with jacket styles listed in table VI, shall be aged for 96 hours at temperatures within ± 5^0 C of the values specified in table VI in a forced draft air oven. These specimens shall then be removed from the oven, allowed to cool at room temperature for 30 minutes and wrapped at a uniform rate of 15 ± 3 rpm at room temperature around a mandrel as specified in table IX. At the end of this period, the specimens shall be removed from the mandrel as a helical coil and be inspected visually for cracks, without the aid of magnification (see 3.8.6).

4.3.11 Crosslinked verification. Twenty-four inch specimens of finished cable with crosslinked jackets (jacket symbols 08, 23, 58, and 73) shall have 1 inch of insulation removed from each end of each conductor. The conductors of each end shall be tied together and loaded with weights equal to one-half the test load weight specified on the basic wire specification sheet times the number of conductors. This shall be done at each end of the specimen. The central portion of the specimen shall then be bent over horizontally positioned smooth stainless steel mandrel of the diameter specified in table IX. To prevent sticking of the wire to the mandrel, the mandrel may be coated with polytetrafluoroethylene in the form of either enamel or wrapped tape, provided that the

diameter of the mandrel after coating is still in conformity with table IX. This specimen so prepared on the mandrel shall be placed in an air-circulating oven and maintained for 6 hours at 200^0 C ± 5^0 C for 08 and 58 jackets and 300^0 C ± 5^0 C for 23 and 73 jackets.. After completion of the air oven exposure, the specimen shall be allowed to cool to between 20^0 C and 25^0 C (68^0 F to 77^0 F). When cooled, the wire shall be freed from tension, removed from the mandrel, and straightened. The specimen shall then be subjected to the bend test (4.3.6), followed by voltage withstand test procedure of 4.3.7.

4.3.12 Bend test. In a temperature maintained between 20^0 C and 25^0 C (68^0 F to 77^0 F), one end of the specimen shall be secured to the mandrel and the other end to the load weight specified in 4.3.11. The mandrel shall be rotated until the full length of the specimen is wrapped around the mandrel and is under the specified tension with adjoining coils in contact. The mandrel shall then be rotated in reverse direction until the full length of the cable which was outside during the first wrapped is now next to the mandrel. This procedure shall be repeated until two bends in each direction have been formed in the same section of the cable. The outer surface of the cable shall then be observed for cracking of the insulation.

4.3.13 Jacket wall thickness. Specimens of finished cable with jacket material listed in table V shall be measured for wall thickness of jacket in accordance with MIL-STD-2223, method 6003.

4.3.13 .1 Jacket tensile strength and elongation. Jacket materials requiring tensile strength and elongation testing (see 3.7.5.1) shall be tested in accordance with ASTM D3032, using 1-inch bench marks, a 1-inch initial jaw separation, and a jaw separation speed of 2-inch per minute.

4.3.14 Lamination sealing (polyimide/fluorinated ethylene propylene single and double jackets only, jacket materials 11, 12, 22, 61, 62, 72). Specimens shall be tested in accordance with MIL-STD-2223, method 4006, except the heat exposure shall be for 6 hours at 230^0 C ± 5^0 C. . The jacket shall be visually inspected for delamination. Any separation of layers either along the insulation or at the ends shall constitute failure.

4.3.15 Jacket blocking. One end of the continuous length of finished cable shall be fixed to a mandrel. The cable shall then be spirally wound around the mandrel so that at least three turns are in close contact with one another. The winding shall be continued until there are three layers of turns with each layer in close contact with one another. One end of previously untested samples of finished cable shall be secured to a mandrel. The other end of each specimen shall be secured to separate load weights sufficient to keep the cable vertical and tangent to the mandrel during the bending operation. The mandrel size shall be as specified in table IX. The mandrel and cable shall then be placed within an air oven at the specified temperature for the specified time period (see 3.3.7). After removal from the oven, the mandrel and cable shall be cooled to room temperature and the cable shall be unwound. There shall be no adhesion or sticking of adjacent turns or layers during the unwinding process.

4.3.16 Concentricity. The concentricity of extruded cable jackets only, shall be tested in accordance with MIL-STD-2223, method 6003, paragraph 4.2.2.

4.3.17 Cable jacket removability. The cable jacket shall be severed circumferentially 4 inches from the cable end. The cable shall be flexed at the point of severance to ensure that the jacket is parted completely. The 4-inch slug of jacket material shall be removed by pulling or working off the cable with the fingers. Finger gripping aids may be used. For jacket styles 11, 12, 22, 61, 62, and 72 only, stripping time shall start when the jacket slug is gripped for removal after severance and shall end when the jacket slug has been completely removed from the cable.

4.3.17.1 PTFE tape wrapped jacket delamination. The contrahelically wrapped PTFE jackets, styles 06 and 56, shall be visually examined for signs of delamination. No instruments or tools shall be used to induce separation of the tape layers.

4.3.18 Shield solderability. Cables with tin and silver coated shields (single shield symbols T, S, M, G, H, J, and double shield symbols V, W, K, A, B, D) shall be tested in accordance with MIL-STD-202, method 208 with the following additions and exceptions:

a. The cable specimen shall be at least seven inches long.
b. The shield shall be exposed for at least 3 inches on the specimen sample under test.
c. A nominal seven inch long standard copper wrapping wire shall be applied to the exposed shield with a spiral wrap around the circumference of the shield. The gap space of the turns of the spiral wrap shall be 0.125 - 0.250 inches and the distance between the end of the exposed shield and the wrapping wire shall be at least 0.50 inches.
d. Do not steam age the sample before solder immersion.

4.4 Cable diameter. Finished cable diameter as measured in a. through c. below shall not exceed the maximum cable diameter calculated as follows:

Unshielded, shielded and single jacketed cables.
Maximum O.D. = (b x A) + (4.45 x d) + (4 x t) (inches).

Double shielded and jacketed cables.
Maximum O.D. = (b x A) + (9.90 x d) + (7 x t) (inches).

Double shielded and single jacketed cables.
Maximum O.D. = (b x A) + (9.90 x d) + (4 x t) (inches).

Where O.D. = outside diameter of the cable.

b = Maximum diameter of basic wires in inches.
A = Cable factor from column A of table IV.
d = Round shield wire diameter or thickness of flat shield wire.
t = Minimum jacket wall thickness as listed in table V, (= 0 for unjacketed cables).

a. For all constructions except three-conductor cables, the measured diameter of the finished cable shall be directly determined with a micrometer, caliper or dial micrometer as the greatest straight line dimension of a cross-section of the cable.

b. For three-conductor unshielded-unjacketed cable only, increase the caliper or dial micrometer reading by 7.7 percent to obtain finished cable diameter.

c. For three-conductor shielded, jacketed or shielded and jacketed cable only, increase the caliper or dial micrometer reading by 15 percent of the specified nominal or median diameter of the basic wire, as given in the applicable wire specification, to obtain finished cable diameter.

4.5 Cable weight.

4.5.1 Measured. The finished cable shall be weighed in accordance with MIL-STD-2223, method 6002 .

4.5.2. Calculated. The finished cable maximum weight shall be calculated by the following procedures. If fillers/binder tapes are used, the maximum calculated cable weight shall be increased by 7 percent.

a. Unshielded and single shield cables.

Cable weight (lbs/1000 ft) = (W x 1.02 x n) + K x d (2.23 x d + b x B) +2720 x t x S (b x B +4.45 x d + 2 x t)

b. Double shielded and jacketed cables.

Cable weight (lbs/1000 ft) = (W x 1.02 x n) + K x d (8.91 x d + 2 x b x B + 3 x t) + 4760 x t x S (7 x d + b x 6+ 3.5 x t)

c. Double shielded single jacket.

Cable weight (lbs/1000 ft) =

(W x 1.02 x n) + Kx d (2.23 x d + b x B) + K x d (6.68 x d + b x B) + 2720 x t x S (b x B + 8.90 x d + 1.5 x t).

Where W = Maximum weight of component wires, pounds/1000 feet.
b = Maximum dimensions of components wires, in inches.
n = Number of conductors in the cable.
d = Shield wire diameter, in inches, or 0.0019 for flat strands, and 0.0 for unshielded.
t = Minimum jacket wall thickness from 4.3.12 (= 0 for unjacketed cables).
B = Effective geometry factor from column B of table IV.
S = Effective specific gravity of jacket material from table X.
K = 14,570 (18,500 for flat strands) for copper shields and 12,750 (16,200 for flat strands) for stainless steel shields (90% minimum shield coverage) or 12,750 for copper shields and 11,150 (14200 for flat strands) for stainless steel shields (85% minimum shield coverage).

4.6 Flammability. Finished cable shall be tested in accordance with ASTM F 777 . The period of flame application shall be 30 seconds for cables having components of size 10 AWG or smaller. Cables with larger components shall not be tested.

4.7 Continuous lengths. Unless otherwise specified in the ordering data (see 6.2), the inspection requirements for continuous lengths (see 3.13) shall be satisfied by the suppliers certificate of conformance and the presence of the required individual length markings on the spools or reels when required by the acquisition requirements (see 6.2.1 h). However the government reserves the right to examine the actual lengths of each lot to assure compliance.

TABLE IX. Test mandrel diameters.

Finished cable diameter (inches)	Cold bend (4.3.5) Crosslinked verification (4.3.10) Blocking (4.3.13) (inches)	Finished cable diameter (inches)	Thermal Shock (4.3.8) Aging stability (4.3.9) (inches)
0 to 0.125	3	0 to 0.083 0.084 to 0.111	0.750 1.0
0.126 to 0.250	6	0.112 to 0.139 0.140 to 0.194	1.250 1.750
0.251 to 0.360	10	0.195 to 0.250 0.251 to 0.334	2.250 3.00
0.361 to 0.750	18	0.335 to 0.444 0.445 to 0.556	4 5
0.751 to 1.200	30	0.557 to 0.667 0.668 to 0.889	6 8
1.201 to 2.000	48	0.890 to 1.111 1.112 to 1.556 1.557 to 2.000	10 14 18

TABLE X. Specific gravity for jacketing materials.

Jacket Styles	Specific gravity
01,02, 03, 04, 05, 06, 07, 09, 16, 20, 21 08, 10 11, 12, 22 14, 15, 17, 18, 23 24	1.4 2.2 1.8 1.6 1.7 1.9

5 . PACKAGING

For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended use. The cable covered by this specification is intended for use in aerospace and ground system applications requiring wires in a cable configuration for additional versatility and protection.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Cable designation (see 1.2.1).
c. Quantity of Cable required.
d. Exceptions, if any to the provisions of this specification.
e. Requirements for supplemental test reports, certifications, or source inspection.
f. Applicable levels of, packaging, and packing (see 5.1).
g. Jacket color (if other than specified in 1.2.1.6).
h. Any special requirements for spool size, spool type, spool labeling.

6.3 Cable designation. Cable will be identified by a combination of digits and letters (not to exceed 16), in accordance with the following (see 3.3.1).

M27500	-	22	SD	3	T	23
Specification number (see 1.2.1.)	Identification method of cable wire and shield coverage (see 1.2.1.1.)	Conductor size (see 1.2.1.2)	Basic wire specification (see 1.2.1.3)	Number of wires in cable (see 1.2.1.4)	Shield style and material (see 1.2.1.5)	Jacket material (see 1.2.1.6)

Example: M27500-22SD3T23 = 22 AWG, 3 conductor, tin shielded 85 %, white XLETFE jacket .

6.4 Shield material. Shield materials N, F, C, Y, Z, R, E, and X provide corrosion resistance. Shield materials I and Q are intended to provide magnetic shielding.

6.5 Preferred shield-style and jacket material. The preferred shield and jacket material for cable types of this specification are as specified in table II. For special applications, construction may be other than those recommended.

6.6 Superseded symbols. The following is a list of superseded basic wire specifications and symbols and their replacements which appear in table I of MIL-C-27500E (USAF).

Table XI - Cross reference of canceled wire symbols and specifications.

Canceled military document	Former table I symbol	Table I symbol replacement wire	Active military document
MIL-W-7139 Class I	D	EA	MIL-W-22759/1
MS17411	V	VA	MIL-W-22759/5
MS17412	W	WA	MIL-W-22759/6
MS18000	S	SA	MIL-W-22759/7
MS18001	T	TA	MIL-W-22759/8
MS18104	LC	JB	MIL-W-22759/28
MS18105	LD	JC	MIL-W-22759/29
MS18113	LA	LE	MIL-W-22759/9
MS18114	LB	LH	MIL-W-22759/10
MS21985	R	RC	MIL-W-22759/11
MS21986	L	RE	MIL-W-22759/12
MIL-W-22759/24	TT	No replacement	-- -- -- -- -- -- --
MIL-W-22759/25	TP	No replacement	-- -- -- -- -- -- --
MIL-W-22759/26	TR	No replacement	-- -- -- -- -- -- --
MIL-W-22759/27	TS	No replacement	-- -- -- -- -- -- --
MIL-W-22759/28 3/	SA	JB	MIL-W-22759/28
MIL-W-22759/29 3/	SB	JC	MIL-W-22759/29
MIL-W-22759/30 3/	SC	JD	MIL-W-22759/30
MIL-W-22759/31 3/	SE	JE	MIL-W-22759/31
MIL-W-22759/36	SF	No replacement	-- -- -- -- -- -- --
MIL-W-22759/37	SG	No replacement	-- -- -- -- -- -- --
MIL-W-22759/38	SJ	No replacement	-- -- -- -- -- -- --
MIL-W-22759/39	SK	No replacement	-- -- -- -- -- -- --
MIL-W-22759/40	SL	No replacement	-- -- -- -- -- -- --
MS24284	K	RE	MIL-W-22759/12
MS27125	J	JA	MIL-W-25038/1
MIL-W-27300	K	RE	MIL-W-22759/12
MIL-W-81044/1	M	ME	MIL-W-81044/6
MIL-W-81044/2	MA	ME	MIL-W-81044/6
MIL-W-81044/3	MB	ML	MIL-W-81044/12
MIL-W-81044/4	MC	ML	MIL-W-81044/12
MIL-W-81044/14	MN	MH	MIL-W-81044/9
MIL-W-81044/15	MP	MJ	MIL-W-81044/10
MIL-W-81044/16	BA	MW 1/	MIL-W-81381/11
MIL-W-81044/17	BB	NA	MIL-W-81381/13
MIL-W-81044/18	BC	MR 1/	MIL-W-81381/7
MIL-W-81044/19	BE	MT	MIL-W-81381/9
MIL-W-81044/20	BF	MW 1/ or ME	MIL-W-81381/11 MIL-W-81044/6
MIL-W-81044/21	BG	MW	MIL-W-81381/11
MIL-W-81044/22	BH	NA	MIL-W-81381/13
MIL-W-81044/23	BJ	RE	MIL-W-22759/12
MIL-W-81044/24	BK	TN	MIL-W-22759/23
MIL-W-81044/25	BL	MR 1/ or	MIL-W-81381/7

Canceled military document	Former table I symbol	Table I symbol replacement wire	Active military document
MIL-W-81044/26	BM	ML	MIL-W-81044/12
		MR 1/ or	MIL-W-81381/7
MIL-W-81044/27	BN	RC	MIL-W-22759/11
		MH	MIL-W-81044/9
MIL-W-81044/28	BP	RE	MIL-W-22759/12
MIL-W-81044/29	BR	TN	MIL-W-22759/23
MIL-W-81044/30	MR 2/	No replacement	-- -- -- -- -- --
MIL-W-81044/31	MT 2/	No replacement	-- -- -- -- -- --
MIL-W-81381/1	Y	MW 1/ or	MIL-W-81381/11
		MR 1/	MIL-W-81381/7
MIL-W-81381/2	YA	MY 1/ or	MIL-W-81381/12
MIL-W-81381/3	YB	MS 1/	MIL-W-81381/8
MIL-W-81381/4	YC	MW 1/	MIL-W-81381/11
MS90294	N	MY 1/	MIL-W-81381/12
		RB	MIL-W-22759/4

1/ These wires are not suitable for contact with missile propellants.
2/ Duplicate of symbols assigned to other specifications now currently assigned to specification MIL-W-81381.
3/ These specification sheets are not canceled, only the designation symbol has been changed.

6.6.1 Manned aerospace replacements. For manned aerospace applications, the following substitutions are suggested for new design.

Replaceable symbols	Replacing symbol
A	ME
AA	CA
AB	MM
AD	CA
B	AA
C	AB
P	NONE

6.7 Subject term (key word) listing.

Crosslinked
Extruded
Fillers and binder tapes
High strength copper alloy
Left-hand lay
Nickel clad
Preferred identification method
Stainless steel shield

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

Custodians:
Army - CR
Navy - AS
Air Force - 85

Review activities:
Army - AR, MI
Air Force -11, 99

Industry Associations:
NEMA, SAE

Preparing Activity:
DLA-CC

(Project - 6145-2165)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER** MIL-DTL-27500H	**2. DOCUMENT DATE (YYMMDD)** 971210

CABLE, POWER, ELECTRICAL AND CABLE SPECIAL PURPOSE, ELECTRICAL SHIELDED AND UNSHIELDED, GENERAL SPECIFICATION FOR

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON *(if applicable)*	**7. DATE SUBMITTED** (YYMMDD)

8. PREPARING ACTIVITY

a. NAME EMELIA ALTOMARI	b. TELEPHONE *Include Area Code)* (1) Commercial (215) 697-6827 (2) AUTOVON
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