INCH-POUND
MIL-DTL-24643/33E
22 August 2002
SUPERSEDING
MIL-C-24643/33D
22 November 1994

DETAIL SPECIFICATION SHEET

CABLE, ELECTRICAL, TYPE LS2SWU

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

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of MIL-DTL-24643 listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation.

REQUIREMENTS:

Qualification required.

Construction (watertight)

First -	Copper conductor, AWG size No.18, class B stranding, (7 by 0.0152 inch) tin coated.
Second -	Separator may be used at manufacturer's option where required to provide free-stripping insulation.
Third -	Cross-linked polyethylene insulation. Nominal wall thickness 0.023 inch; wall thickness may vary from nominal as necessary, in order for completed cable to meet the specified electrical requirements. Colored insulation, one black and one white conductor for each pair.
Fourth -	Two conductors (one black and one white) cabled together with a nominal lay of 3 inches to form a pair. 1/
Fifth -	Binder tape over each pair, applied at manufacturer's option, applied helically with overlap.
Sixth -	Braided shield of AWG No. 34 or No. 36 tin coated copper. Braid angle of 30 to 35 degrees; minimum coverage of 85 percent.

Construction (watertight) (continued)

Seventh - Shield insulation of two polyester tapes, per NEMA FI 4, outer tape sealed. An alternate shield insulation may consist of one polyester tape, per NEMA FI 4, plus an extruded jacket of a suitable transparent material, minimum average thickness of the transparent material 0.003 inch. The standard identification code shall be applied by method 2 on the inner tape.

[1/] For LS2SWU-1. omit seventh, eighth and ninth.

Eighth - The required number of pairs (see table I) cabled together with a lay not greater than 24 times the pitch diameter of the layer. Cabling sequence shall be consecutive, starting with no. 1, from the center outward. Fillers shall be used as necessary to make a firm, well rounded assembly.

Ninth - Binder tape, applied helically with overlap.

Tenth - Cross-linked polyolefin jacket. (see table I for thickness).

TABLE I. Details.

Military [2/] part no. M24643/33	Size	Number of pairs	Diameter over completed pair nominal (inch)	Cable jacket thickness min avg (inch)	Overall diameter (inches) TYPE LS2SWU	
					min	max
-01UN	LS2SWU-1	1	0.213	0.015	0.240	0.255
-02UN	LS2SWU-3	3	0.213	0.075	0.670	0.710
-03UN	LS2SWU-7	7	0.213	0.075	0.860	0.910
-04UN	LS2SWU-12	12	0.213	0.088	1.130	1.200
-05UN	LS2SWU-19	19	0.213	0.100	1.292	1.380
-06UN	LS2SWU-24	24	0.213	0.100	1.500	1.590
-07UN	LS2SWU-30	30	0.213	0.100	1.670	1.760
-08UN	LS2SWU-37	37	0.213	0.125	1.785	1.870
-09UN	LS2SWU-61	61	0.213	0.125	2.205	2.300

[2/] When double overall shield is required, see MIL-DTL-24643 for configuration of part number.

EXAMINATION AND TESTS:

Basic electrical:	Requirements:
Conductor resistance - ohms/1000 feet at 25°C, maximum	7.47
Voltage withstand - volts, root mean square, minimum	
Conductor to conductor	2000
Shield to shield [3/]	500
Shield to water	500
Insulation resistance - Megohms -1000 feet minimum	
Conductor to conductor	500
Component shield to shield	100

Conductor and shield continuity ..... No failure

[3/] Not required for type LS2SWU-1.

Group A:

Visual and dimensional ..... No failure
Hydrostatic (open end) - leakage at 300 lb/in^2,
2 hours, in^3, maximum 1.0
Capacitance
Mutual capacitance - 1 megahertz (MHz), pF/ft, maximum 30
Capacitance unbalance - percent maximum 8
Characteristic impedance - at 1MHz, ohms ..... 75 $\pm$ 5
Cable attenuation - power loss (at sinusoidal frequency
of 1 MHz), decibels (db)/ 100 FT, maximum 1.5

Group B:

Cross-linked proof test (percent, maximum)
Insulation 50
Jacket (When tested at 200°C) 50
Drip - 95 $\pm$ 1°C ..... Zero
Tear - pounds per inch thickness, minimum (ASTM D 470) 35
Physicals (unaged)
Insulation
Tensile strength - lb/in^2, minimum 1800
Elongation - percent, minimum 250
Jacket (cable)
Tensile strength - lb/in^2, minimum 1300
Elongation - percent, minimum 160
Physicals (aged)
Insulation
Air oven
Tensile strength - percent of unaged, minimum 80
Elongation - percent of unaged minimum 80
Jacket (cable)
Air oven
Tensile strength - percent of unaged, minimum 60
Elongation - percent of unaged minimum 60
Hot oil immersion
Tensile strength - percent of unaged, minimum 50
Elongation - percent of unaged, minimum 50
Shrinkage ..... No failure
Heat distortion - percent of unaged, maximum 30
Permanence of printing (jacket) - cycles, minimum 125
Cable sealant removability ..... No failure

Group D:

Flame propagation (cable) ..... No failure

QUALIFICATION INSPECTION:

Qualification inspection shall include basic electrical, all of groups A, B, C and D, plus the following:

- Aging and compatibility (cable) (125 ± 5°C) ..... No failure
- Abrasion resistance (jacket) - scrapes, minimum 75
- Acid gas equivalent - percent, maximum
  - Jacket 2
  - Fillers 2
  - Insulation 18
  - Shield insulation 2
- Halogen content - percent, maximum
  - Jacket 0.2
  - Fillers 0.2
- Immersion (jacket)
  - Tensile strength - percent of unaged, minimum 50
  - Elongation - percent of unaged, minimum 50
- Smoke index, maximum
  - Jacket 25
  - Fillers 45
  - Insulation 45
- Toxicity index, maximum
  - Jacket 5
  - Fillers 5
  - Insulation 1.5
- Durometer (jacket) - (type A) hardness, minimum 80
- Weathering (jacket) ..... No failure

UNIT ORDERING LENGTHS:

Size	Feet (nominal)
1 through 12	1500
19 through 24	1000
30 through 61	500

Custodians:
Army - MI
Navy - SH

Preparing Activity:
Navy - SH
(Project 6145-2308-031)

Review Activities:
Army - AV, CR
Navy - CG, EC
DLA – CC