

INCH-POUND

MIL-DTL-24643/64A

28 January 2010

SUPERSEDING

MIL-DTL-24643/64

28 June 2007

## DETAIL SPECIFICATION SHEET

CABLE, ELECTRICAL, TWISTED SHIELDED PAIR(S), -40 °C TO 105 °C, 600V, TYPE LSTPSJ

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 MIL-DTL-24643.

### Construction (Non-Watertight)

- First - Copper conductor, tin-coated, in accordance with ASTM B286 (see [table I](#) for sizes).
- Second - Optional separator.
- Third - Thermoset insulation. Nominal 0.010 inch (see [table I](#) for finished wire diameter).
- Fourth - Two conductors (one black and one white) twisted together with a lay length as specified in [table II](#).
- Fifth - Braided shield of 36 AWG tin-coated copper. Minimum coverage shall be 90 percent and the braid angle shall be between 20 and 40 degrees.
- Sixth - The required number of pairs (see [table III](#)) cabled together with a lay length as specified in 3.4.4 of MIL-DTL-24643. Fillers may be used as required to form a well-rounded assembly.
- Seventh - Optional binder.
- Eighth - Cross-linked polyolefin (XLPO) jacket. Jacket wall thickness shall be 0.030±0.005 inch for cables with core diameters less than 0.300 inch. Jacket wall thickness shall be 0.040±0.005 inch for cables with core diameters equal to or greater than 0.300 inch (see [table III](#) for finished cable diameter).

TABLE I. Wire configurations and dimensions.

Wire size	Stranding	Conductor diameter (inch) ( $\pm 0.003$ inch)	Finished wire diameter (inch)		Conductor resistance (ohms/1000 ft) at 25 °C, max.
			Min.	Max.	
24	19 X 36	0.024	0.041	0.047	24.91
22	19 X 34	0.030	0.047	0.053	15.59
20	19 X 32	0.039	0.056	0.062	9.57
18	19 X 30	0.049	0.066	0.072	6.10
16	19 X 29	0.056	0.073	0.079	4.73
14	19 X 27	0.070	0.087	0.093	2.99

TABLE II. Length of lay.

Wire size range	Lay length	Twist tolerance (inch)
20-24	1	$\pm 0.25$
14-18	1.5	$\pm 0.25$

TABLE III. Cable core and finished cable diameter.

Part no. M24643/64	Wire size	Number of pairs	Cable core diameter (includes braid and optional binder) (inch) ( $\pm 0.006$ inch for single pair) ( $\pm 0.030$ inch for multi-pair cables)	Finished cable diameter (inch) ( $\pm 0.016$ inch for single pair cables) ( $\pm 0.030$ inch for multi-pair cables)
-01UN	24	1	0.110	0.170
-02UN	22	1	0.122	0.182
-03UN	20	1	0.140	0.200
-04UN	18	1	0.160	0.220
-05UN	16	1	0.174	0.234
-06UN	14	1	0.202	0.262
-07UN	24	2	0.200	0.260
-08UN	22	2	0.225	0.285
-09UN	20	2	0.265	0.325
-10UN	18	2	0.310	0.390
-11UN	16	2	0.340	0.420
-12UN	14	2	0.385	0.465
-13UN	24	3	0.215	0.275
-14UN	22	3	0.225	0.285
-15UN	20	3	0.265	0.325
-16UN	18	3	0.310	0.390
-17UN	16	3	0.370	0.450

TABLE III. Cable core and finished cable diameter – Continued.

Part no. M24643/64	Wire size	Number of pairs	Cable core diameter (includes braid and optional binder) (inch) (±0.006 inch for single pair) (±0.030 inch for multi-pair cables)	Finished cable diameter (inch) (±0.016 inch for single pair cables) (±0.030 inch for multi-pair cables)
-18UN	14	3	0.410	0.490
-19UN	24	4	0.235	0.295
-20UN	22	4	0.265	0.325
-21UN	20	4	0.315	0.395
-22UN	18	4	0.370	0.450
-23UN	16	4	0.400	0.480
-24UN	14	4	0.460	0.540

## REQUIREMENTS:

Qualification Required.

## INSPECTION:

## Basic Electricals:

Conductor resistance (ohms/1000 feet at 25 °C, max.) See [table I](#)

Voltage withstand (volts, root mean square, min.)

Conductor to conductor 2000

Conductor to shield 1000

Insulation resistance (megohms/1000 feet, min.)

Conductor to conductor 500

Conductor to shield 500

Conductor and shield continuity No failure

Jacket flaws No failure

## Group A:

Visual and dimensional No failure

## Group B:

Drip (105±1 °C) Zero

Thermoset proof test (percent, max.)

Insulation 50

Jacket (when tested at 200 °C) 50

Physicals (unaged)

Insulation

Tensile strength (lb/in <sup>2</sup> , min.)	700
Elongation (percent, min.)	150
Jacket	
Tensile strength (lb/in <sup>2</sup> , min.)	1300
Elongation (percent, min.)	160
Group C:	
Physicals (aged) (air oven)	
Insulation	
Tensile strength (percent of unaged, min.)	75
Elongation (percent of unaged, min.)	75
Jacket (cable)	
Tensile strength (percent of unaged, min.)	60
Elongation (percent of unaged, min.)	60
Shrinkage	No failure
Heat distortion (percent of unaged, max.)	30
Permanence of printing (jacket) (cycles, min.)	125
Shield-conformance to material, constructions and coverage	No failure
Group D:	
Flame propagation (finished cable)	No failure
Qualification Inspection:	
Qualification inspection shall include basic electricals; groups A, B, C, and D; plus the following:	
Aging and compatibility (cable)	No failure
Abrasion resistance (jacket)	No failure
Durometer (jacket) – Type A (hardness, min.)	80
Weathering (jacket)	No failure
Acid gas equivalent (percent, max.)	
Jacket	2
Fillers	2
Insulation	18
Halogen content (percent, max.)	
Jacket	0.2
Fillers	0.2
Insulation	0.2

Immersion (jacket)	
Tensile strength (percent of unaged, min.)	50
Elongation (percent of unaged, min.)	50
Smoke index, max.	
Jacket	25
Fillers	45
Insulation	45
Toxicity index, max.	
Jacket	5
Fillers	5
Insulation	1.5

UNIT ORDERING LENGTHS:

<u>Type and size</u>	<u>Feet (nominal)</u>
LSTPSJ	All sizes 1000 feet

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 – MI  
Navy – SH

Preparing Activity:

Navy – SH  
(Project 6145-2009-107)

Review Activities:

Army – AR, AV, CR  
Navy – CG, EC  
DLA – CC

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