

MIL-W-5086/7B
 23 November 1983
 SUPERSEDING
 MIL-W-5086/7A
 2 December 1974

MILITARY SPECIFICATION SHEET

(B) WIRE, ELECTRICAL, POLYVINYL CHLORIDE INSULATED, NYLON JACKET, TIN-COATED COPPER CONDUCTOR, MEDIUM WEIGHT, 600-VOLT, 105°C

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

The complete requirements for acquiring the wire described herein shall consist of this document and the latest issue of Specification MIL-W-5086.

(B) FROM DATE OF ISSUE OF THIS REVISION, WIRE OF THIS SPECIFICATION SHEET SHALL NOT BE USED IN AEROSPACE APPLICATIONS. SEE "NON-USE" NOTE ON PAGE 3.

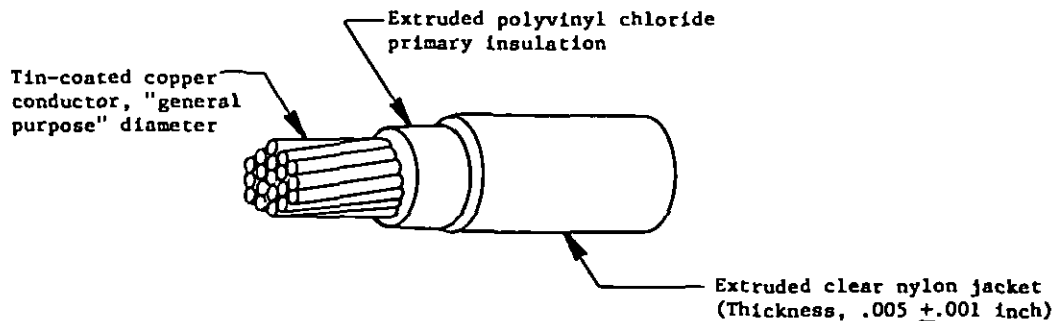


TABLE I. Construction details.

Part no. <u>1/</u>	Wire size	Stranding (Number of strands X AWG gage of strands)	Diameter of stranded conductor (inches)		Finished wire		
			(min)	(max)	Resistance at 20°C (68°F) (ohms/1000 ft) (max)	Diameter (inches)	Weight (lbs/1000 ft) (max)
M5086/7-24-*	24	19 x 36	.023	.026	26.2	.054 ±.002	2.7
M5086/7-22-*	22	19 x 34	.029	.033	16.2	.062 ±.003	3.9
M5086/7-20-*	20	19 x 32	.037	.041	9.88	.070 ±.003	5.5
M5086/7-18-*	18	19 x 30	.046	.051	6.23	.080 ±.003	8.0
M5086/7-16-*	16	19 x 29	.052	.058	4.81	.089 ±.004	10.1
M5086/7-14-*	14	19 x 27	.065	.073	3.06	.108 ±.004	15.5
M5086/7-12-*	12	37 x 28	.084	.090	2.02	.126 ±.004	23.0
M5086/7-10-*	10	37 x 26	.106	.114	1.26	.155 ±.005	35.7

1/ Part no.: The asterisks in the part number column, Tables I and II, shall be replaced by color code designators in accordance with MIL-STD-681. Examples: Size 20, white - M5086/7-20-9; white with orange stripe - M5086/7-20-93.

(B) denotes changes

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(B)

TABLE II. Bend test mandrels and test loads.

Part no.	Mandrel diameter (inches) ($\pm 3\%$)			Test load (lbs) ($\pm 3\%$)	
	Life cycle (oven and bend tests) 1/	Cold bend test	Wrap test	Life cycle (oven and bend tests) 1/	Cold bend test
M5086/7-24-*	3.0	2.0	0.32	.50	1.0
M5086/7-22-*	4.5	3.0	0.37	.75	2.0
M5086/7-20-*	4.5	3.0	0.42	.75	2.0
M5086/7-18-*	4.5	3.0	0.48	1.00	2.0
M5086/7-16-*	6.5	3.0	0.53	1.00	3.0
M5086/7-14-*	6.5	6.0	0.65	1.00	3.0
M5086/7-12-*	6.5	6.0	0.77	3.00	3.0
M5086/7-10-*	10.0	6.0	0.93	3.00	5.0

1/ Also for bend tests after immersion.

Wire ratings and additional requirements

Temperature rating: 105°C (221°F) max conductor temperature

Voltage rating: 600 volts (rms) at sea level

Blocking: 105° $\pm 2^\circ\text{C}$ (221° $\pm 3.6^\circ\text{F}$)

Color: In accordance with MIL-STD-104, Class 1; white preferred

Color stripping or banding durability: 250 cycles (500 strokes) (min), 500 grams weight

Flammability (Method 1):

30 sec (max) after-flame

1.50 inches (max) flame travel, either direction on wire

No flaming of tissue paper

Humidity resistance: 100 megohms for 1000 ft, min insulation resistance after humidity exposure

Identification durability: 125 cycles (250 strokes) (min), 500 grams weight

Impulse dielectric test:

Primary insulation (when test is used in lieu of spark test): 6.0 kilovolts (peak), 100% test

Finished wire: 8.0 kilovolts (peak), 100% test

Insulation resistance: 500 megohms for 1000 ft (min)

Life cycle: Oven temperature, 120° $\pm 2^\circ\text{C}$ (248° $\pm 3.6^\circ\text{F}$)Low temperature (cold bend): -55° $\pm 2^\circ\text{C}$ (-67° $\pm 3.6^\circ\text{F}$)Shrinkage: 0.125 inch max at 150° $\pm 2^\circ\text{C}$ (302° $\pm 3.6^\circ\text{F}$)

Smoke: 110°C (230°F)

Spark test of primary insulation: 3000 volts (rms), 60 Hz, 100% test

Surface resistance: 5 megohm-inches (min), initial and final readings

Thermal shock: Oven temperature, 105° $\pm 2^\circ\text{C}$ (221° $\pm 3.6^\circ\text{F}$)

Max change in measurement, 0.06 inch

Wet dielectric test: 2000 volts (rms)

Wrap test oven temperature: 95° $\pm 2^\circ\text{C}$ (203° $\pm 3.6^\circ\text{F}$)(B) Metric conversion note: Data in this specification sheet may be converted to metric as follows:

Linear dimensions 25.40 x inches = millimeters (mm)

Weight (general) .4536 x lbs = kilograms (kg)

Wire weight 1.488 x (lbs/1000 ft) = kg/km

Conductor resistance 3.281 x (ohms/1000 ft) = ohms/km

Insulation resistance .3048 x (megohms for 1000 ft) = megohms for 1 km

Surface resistance Metric documents may differ from MIL-STD-228 in spacing of the electrodes for this determination and in the method of expressing the code spacing is 25.0 millimeters in the

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metric document, the MIL-W-5086 megohm-inches resistance (defined as total megohms resistance times inches wire diameter) may be converted as follows:

25.0 x (megohm-inches diameter) = megohm-mm diameter
 78.5 x (megohm-inches diameter) = megohm-mm circumference
 3.14 x (megohm-inches diameter) = megohm-mm circumference per mm
 of electrode spacing

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NON-USE AND REPLACEMENT OF MIL-W-5086/7 WIRE IN AEROSPACE APPLICATIONS: The exclusion of MIL-W-5086/7 wire from aerospace applications (page 1 of this document) is in consonance with the provisions of MIL-STD-454 and several military aerospace directives concerning polyvinyl chloride materials.

Replacement wires for the MIL-W-5086/7 items for aerospace applications should be selected from the lists of approved wires in the latest issue of MIL-W-5088, Wiring, Aerospace Vehicle, with due regard to the weight, dimensional, and functional requirements of the specific project or application.

Custodians:

Navy - AS
 Army - CR
 Air Force - 85

Preparing activity:

Navy - AS
 (Project No. 6145-0822-7)

Review activities:

Navy - OS
 Army - AR, ME, MI
 Air Force - 99
 DLA - IS
 NSA

User activities:

Navy - EC, MC, SH
 Army - AT, AV
 Air Force - 11