

Wire, Electrical, Polyvinyl Chloride Insulated,
PVC-Glass-PVC-Nylon, Tin-Coated Copper Conductor, 600-Volt, 105°C
FSC 6145

RATIONALE

AS50861/3 has been reaffirmed to comply with the SAE five-year review policy.

NOTICE

This document has been taken directly from U.S. Military Specification MIL-W-5086/3B, Amendment 1 and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-W-5086/3B, Amendment 1. Any part numbers established by the original specification remain unchanged.

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

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 5.

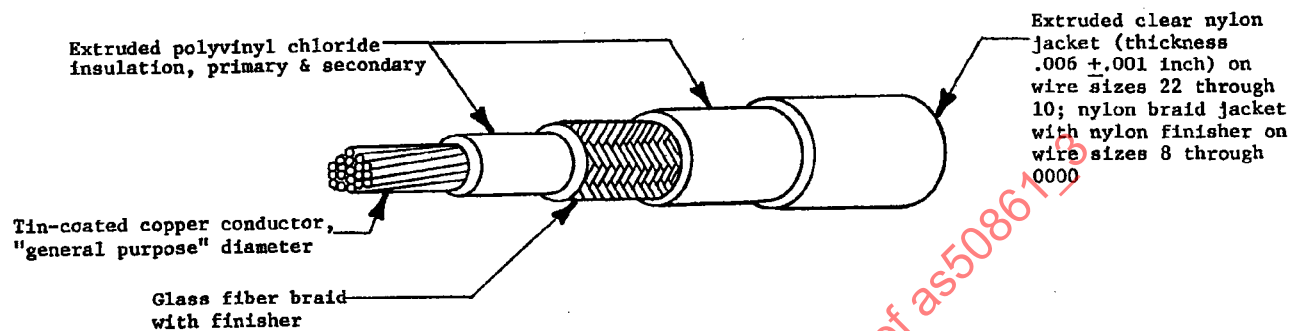


TABLE I. Construction details.

Part no. ^{1/}	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)
M5086/3-22-*	22	19 x 34	.029	.033	16.2	.085 ± .005	5.7
M5086/3-20-*	20	19 x 32	.037	.041	9.88	.095 ± .005	7.6
M5086/3-18-*	18	19 x 30	.046	.051	6.23	.110 ± .005	11.0
M5086/3-16-*	16	19 x 29	.052	.058	4.81	.125 ± .005	14.0
M5086/3-14-*	14	19 x 27	.065	.073	3.06	.143 ± .007	20.0
M5086/3-12-*	12	37 x 28	.084	.090	2.02	.163 ± .007	28.3
M5086/3-10-*	10	37 x 26	.106	.114	1.26	.193 ± .007	44.0
M5086/3-8-*	8	133 x 29	.158	.173	.701	.248 ± .007	70.0
M5086/3-6-*	6	133 x 27	.198	.217	.445	.303 ± .007	113.0
M5086/3-4-*	4	133 x 25	.250	.274	.280	.360 ± .010	170.0
M5086/3-2-*	2	665 x 30	.320	.340	.183	.435 ± .010	250.0
M5086/3-1-*	1	817 x 30	.360	.380	.149	.485 ± .010	310.0
M5086/3-01-*	0	1045 x 30	.395	.425	.116	.535 ± .015	400.0
M5086/3-02-*	00	1330 x 30	.440	.475	.091	.595 ± .015	500.0
M5086/3-03-*	000	1665 x 30	.500	.540	.071	.665 ± .015	620.0
M5086/3-04-*	0000	2109 x 30	.565	.605	.056	.735 ± .015	785.0

^{1/} Part no.: The asterisks in the part number column, Tables I through III, shall be replaced by color code designators in accordance with MIL-STD-681. Examples: Size 20, white - M5086/3-20-9; white with orange stripe - M5086/3-20-93.

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) <u>1/</u>	Gold bend test	Wrap test	Life cycle (oven and bend tests) <u>1/</u>	Gold bend test
M5086/3-22-*	4.5	3.0	0.51	.75	2.0
M5086/3-20-*	4.5	3.0	.57	.75	2.0
M5086/3-18-*	4.5	3.0	.66	1.0	2.0
M5086/3-16-*	6.5	3.0	.75	1.0	3.0
M5086/3-14-*	6.5	6.0	.86	1.0	3.0
M5086/3-12-*	6.5	6.0	.98	3.0	3.0
M5086/3-10-*	10.0	6.0	1.16	3.0	5.0
M5086/3-8-*	10.0	6.0	---	3.0	5.0
M5086/3-6-*	10.0	10.0	---	6.0	10.0
M5086/3-4-*	10.0	10.0	---	6.0	10.0
M5086/3-2-*	10.0	18.0	---	6.0	15.0
M5086/3-1-*	10.0	18.0	---	6.0	15.0
M5086/3-01-*	10.0	18.0	---	10.0	20.0
M5086/3-02-*	10.0	18.0	---	10.0	25.0
M5086/3-03-*	10.0	18.0	---	10.0	30.0
M5086/3-04-*	10.0	18.0	---	10.0	30.0

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° $\pm 2^\circ$ C (221° $\pm 3.6^\circ$ F)

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

Color striping or banding durability:

Sizes 22 through 10: 250 cycles (500 strokes) (min), 500 grams weight

Sizes 8 through 0000: 50 cycles (100 strokes) (min), 250 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:

Sizes 22 through 10: 100 megohms for 1000 ft, min insulation resistance after humidity exposure

Sizes 8 through 0000: Not applicable

Identification durability:

Sizes 22 through 10: 125 cycles (250 strokes) (min), 500 grams weight

Sizes 8 through 0000: 50 cycles (100 strokes) (min), 250 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:

Sizes 22 through 10: 500 megohms for 1000 ft (min)

Sizes 8 through 0000: Not applicable

Life cycle: Oven temperature, $120^{\circ} \pm 2^{\circ}\text{C}$ ($248^{\circ} \pm 3.6^{\circ}\text{F}$)

Low temperature (cold bend): $-55^{\circ} \pm 2^{\circ}\text{C}$ ($-67^{\circ} \pm 3.6^{\circ}\text{F}$)

Shrinkage: 0.125 inch max at $150^{\circ} \pm 2^{\circ}\text{C}$ ($302^{\circ} \pm 3.6^{\circ}\text{F}$)

Smoke: 110°C (230°F)

Spark test of primary insulation:

Sizes 22 through 10: 3000 volts (rms), 60 Hz, 100% test

Sizes 8 through 0000: 4000 volts (rms), 60 Hz, 100% test

Surface resistance:

Sizes 22 through 10: 5 megohm-inches (min), initial and final readings

Sizes 8 through 0000: Not applicable

Thermal shock:

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

The maximum shrinkage permitted for PVC insulation is .060 inch. Sizes 8 through 0000 gauge wire is permitted to have the polyamide insulation layer shrink .125 maximum.

Wet dielectric test: 2000 volts (rms)

Wrap test oven temperature:

Sizes 22 through 10: $95^{\circ} \pm 2^{\circ}\text{C}$ ($203^{\circ} \pm 3.6^{\circ}\text{F}$)

Sizes 8 through 0000: Not applicable

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	Where the electrode spacing is 25.0 millimeters in the 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

SUPERSESSSION DATA: The wire of this specification sheet replaces and supersedes Type III wire of MIL-W-5086A (superseded 19 March 1968) and MS25190 (canceled 29 May 1969). Supersession by part number is in accordance with Table III.