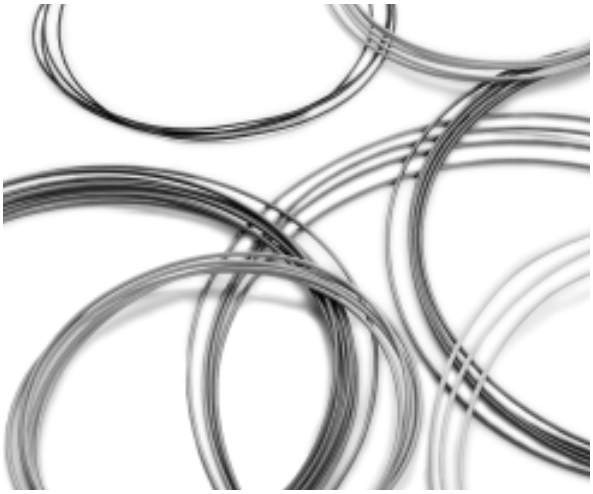
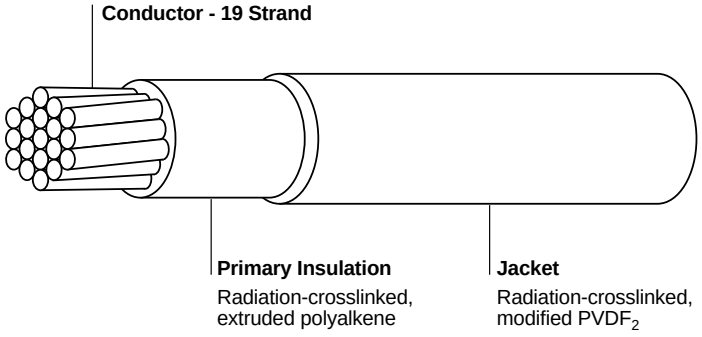
High-performance wire and cable insulation system for –65°C to 150°C

Applications
Hookup and signal wire and cable used in aircraft, avionics, military electronics, satellites, helicopters, ships, mass transit, offshore platforms, and automobiles.

Features/Benefits
- Operating temperatures of –65˚C to 150˚C.
- Dual-wall constructions.
- Small size, light weight.
- Exceptional chemical resistance.
- Mechanical ruggedness.
- Excellent shop handling and flexibility.
- Choice of marking with hot stamp or ink jet.
- Pottable insulation system.
- Solderable conductor.
- Resistance to electrical arc tracking in wet or dry conditions.
- Primary wire and cable configurations.
- 600-, 1000-, and 2500-volt constructions.



SPEC 44 Insulation System



Specifications

UL	CSA	Military	Industry	Agency	Raychem
1385	Class 5851 File 41234	MIL-W-81044, MIL-C-27500 (cables)	Lloyds Register of Shipping	VG88929, VG95211, and VG95218 Part 1000	Raychem SPEC 44
1564		Def. Stan. 61-12, Part 18, Issue 2, Type 1		MTV6145-005	
		Def. Stan. 61-12, Part 26		NASA preferred product list	
		British Standard G233		MSV34401	
				Civil Aviation Authority Accessory Approval E11623	
				European Space Agency 3901/011 and 3901/012	

Typical Properties

Physical characteristics	
Operating temperature range	–65˚C to 150˚C
Tensile strength (primary insulation)	3500 psi
Elongation (primary insulation)	250%
Flammability	Passes the 60-degree tests of MIL-W-81044 and Federal Aviation Regulation FAR-25
Accelerated aging (6hr/300˚C)	Passes mandrel wrap and dielectric test per MIL-W-81044
Smoke	No visible smoke at 200˚C
Electrical arc tracking	Tested to ASTM D3032

Electrical performance	
Voltage rating	600, 1000, and 2500 volts
Insulation resistance	5000 megohms for 1000 ft (min)
Voltage withstand	2500, 3000, and 5000 volts for 5 minutes, 60 Hz, rms

SPEC 44 Part Numbering System

44 XXXXX - AWG - XX/XX/XX - X

Base color of primary wire or cable jacket. Replace X by number indicating base color for primary wire or jacket color (0 = black; 1 = brown; 2 = red; 2L = pink; 3 = orange; 4 = yellow; 5 = green; 6 = blue; 7 = violet; 8 = gray; 9 = white). Additional number(s) after base color indicates stripe(s) color(s); for example 95 = white wire with a green stripe, or 952 = white wire with a green stripe followed by a red stripe.

Component color code (required for cable constructions only). Replace XX by number(s) indicating base color followed by stripe(s) as required. Slashes are used to separate individual component wire colors.

Wire size (American Wire Gauge).

Conductor type. 1 = tin-coated copper; 2 = silver-coated copper; 3 = nickel-coated copper; 4 = high-strength copper alloy (HSCA), silver coated; 5 = aluminum; 6 = nickel-coated HSCA.

Number of conductors. 1 through 9.

Class of wire. 1 = 600-V lightweight wire; 2 = 1000-V wire; 3 = 2500-V wire; 4 = 600-V space wire; 7 = normal-weight wire; 8 = medium-weight wire.

Construction. 0 = primary wire; 1 = round-braid shielded, jacketed; 2 = flat-braid shielded, jacketed; 3 = round-braid shielded, no jacket; 4 = jacketed, no shield; 5 = spirally shielded, jacketed, 6 through 9 = special constructions.

Temperature rating. / = 135˚C; A = 150˚C; AM = designation for M27500 cables, 150˚C; B = 150˚C with modified crosslinked ethylene tetrafluoroethylene (ETFE) jacket for cable in place of crosslinked polyvinylidene fluoride (PVDF).

Example: 44AM1131-22-9/96/93-9
Round-braid shielded and jacketed cable per M27500 with three conductors of 600-V, lightweight, 22 AWG tin-coated copper wires. Components are coded white, white with a blue stripe, and white with an orange stripe with an overall white crosslinked PVDF jacket.

Temperature rating	Conductor material	AWG range available	Raychem part no.	MIL-SPEC no.
150°C				
600-V lightweight single-wall hookup wire, .0075-inch nominal wall				
	Tin-coated copper	12–30	44A0111-	MIL-W-81044/12
	Silver-coated copper	12–30	44A0112-	MIL-W-81044/11
	Nickel-coated copper	12–30	44A0113-	
	Silver-coated high-strength copper alloy	20–30	44A0114-	MIL-W-81044/13
	Nickel-coated high-strength copper alloy	20–26	44A0116-	
150°C				
1000-V lightweight dual-wall hookup wire, .010-inch nominal wall				
	Tin-coated copper	4–30	44A0211-	
	Silver-coated copper	4–26	44A0212-	
	Nickel-coated copper	4–26	44A0213-	
	Silver-coated high-strength copper alloy	20–26	44A0214-	
150°C				
2500-V lightweight dual-wall hookup wire, .020-inch nominal wall				
	Tin-coated copper	0–26	44A0311-	
	Silver-coated copper	0–24	44A0312-	
	Nickel-coated copper	00–24	44A0313-	
	Silver-coated high-strength copper alloy	20–28	44A0314-	
150°C				
600-V medium-weight dual-wall hookup wire, .015-inch nominal wall				
	Tin-coated copper	0–24	44A0811-	MIL-W-81044/9
	Silver-coated copper	0–24	44A0812-	MIL-W-81044/8
	Nickel-coated copper	12–24	44A0813-	
	Silver-coated high-strength copper alloy	20–26	44A0814-	MIL-W-81044/10
	Aluminum	00–8	44A0815-	
150°C				
600-V normal-weight dual-wall hookup wire, .020-inch nominal wall				
	Tin-coated copper	0–24	44A0711-	MIL-W-81044/6
	Nickel-coated copper	0–24	44A0713-	
	Silver-coated high-strength copper alloy	20–26	44A0714-	MIL-W-81044/7
	Aluminum	0–8	44A0715-	

Wire size (AWG)	Raychem part number[a,b]	Conductor stranding (no. × AWG)	Nom. diameter in inches *(mm)*	Max. weight[c] in lb/1000 ft *(g/m or kg/km)*
Light weight				
600-volt 44A011X[a] .0075-inch wall thickness				
30	44A011X-30-Y	7 × 38	.027 *(.69)*	.71 *(1.06)*
28	44A011X-28-Y	7 × 36	.030 *(.76)*	.96 *(1.48)*
26	44A011X-26-Y	19 × 38	.034 *(.86)*	1.40 *(2.08)*
24	44A011X-24-Y	19 × 36	.040 *(1.02)*	2.00 *(2.98)*
22	44A011X-22-Y	19 × 34	.047 *(1.19)*	3.00 *(4.46)*
20	44A011X-20-Y	19 × 32	.055 *(1.40)*	4.50 *(6.70)*
18	44A011X-18-Y	19 × 30	.065 *(1.65)*	6.80 *(10.12)*
16	44A011X-16-Y	19 × 29	.072 *(1.83)*	8.60 *(12.80)*
14	44A011X-14-Y	19 × 27	.089 *(2.26)*	13.20 *(19.64)*
12	44A011X-12-Y	37 × 28	.108 *(2.75)*	20.20 *(30.06)*
1000-volt 44A021X[a] .010-inch wall thickness				
30	44A021X-30-Y	7 × 38	.032 *(.81)*	.90 *(1.84)*
28	44A021X-28-Y	7 × 36	.035 *(.89)*	1.10 *(1.64)*
26	44A021X-26-Y	7 × 34	.040 *(1.02)*	1.60 *(2.38)*
24	44A021X-24-Y	19 × 36	.046 *(1.17)*	2.40 *(3.57)*
22	44A021X-22-Y	19 × 34	.054 *(1.37)*	3.50 *(5.21)*
20	44A021X-20-Y	19 × 32	.062 *(1.57)*	5.10 *(7.54)*
18	44A021X-18-Y	19 × 30	.073 *(1.85)*	7.70 *(11.46)*
16	44A021X-16-Y	19 × 29	.081 *(2.06)*	9.80 *(14.58)*
14	44A021X-14-Y	19 × 27	.098 *(2.49)*	14.70 *(21.88)*
12	44A021X-12-Y	37 × 28	.117 *(2.97)*	22.10 *(32.89)*
10	44A021X-10-Y	37 × 26	.146 *(3.71)*	35.60 *(52.98)*
8	44A021X-8-Y	133 × 29	.206 *(5.23)*	61.80 *(91.97)*
2500-volt 44A031X[a] .020-inch wall thickness				
24	44A031X-24-Y	19 × 36	.057 *(1.45)*	3.00 *(4.46)*
22	44A031X-22-Y	19 × 34	.069 *(1.75)*	4.30 *(6.40)*
20	44A031X-20-Y	19 × 32	.078 *(1.98)*	6.10 *(9.08)*
18	44A031X-18-Y	19 × 30	.088 *(2.24)*	8.70 *(12.95)*
16	44A031X-16-Y	19 × 29	.097 *(2.46)*	10.90 *(16.22)*
14	44A031X-14-Y	19 × 27	.115 *(2.92)*	16.20 *(24.11)*
12	44A031X-12-Y	37 × 28	.131 *(3.33)*	24.20 *(36.01)*
10	44A031X-10-Y	37 × 26	.161 *(4.09)*	36.50 *(54.32)*
8	44A031X-8-Y	133 × 29	.219 *(5.56)*	65.00 *(96.73)*
6	44A031X-6-Y	133 × 27	.269 *(6.83)*	103.00 *(153.28)*
4	44A031X-4-Y	133 × 25	.325 *(8.26)*	158.00 *(235.13)*
2	44A031X-2-Y	665 × 30	.404 *(10.26)*	252.00 *(375.02)*
0	44A031X-0-Y	1045 × 30	.494 *(12.55)*	380.00 *(565.50)*

[a]X = conductor type (see Part Numbering System on page 10-2)

[b]Y = color as specified

* Color code:
0 = Black
1 = Brown
2 = Red
3 = Orange
4 = Yellow
5 = Green
6 = Blue
7 = Violet
8 = Gray
9 = White

[c]Weight is for tin-coated copper conductor.

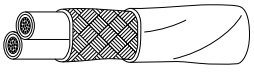
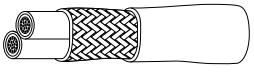
Wire size (AWG)	Raychem part number[a,b]	Conductor stranding (no. × AWG)	Nom. diameter in inches *(mm)*	Max. weight[c] in lb/1000 ft *(g/m or kg/km)*
Medium weight				
600-volt 44A081X[a] .0150-inch wall thickness				
26	44A081X-26-Y	19 × 38	.048 *(1.22)*	1.90 *(2.83)*
24	44A081X-24-Y	19 × 36	.054 *(1.37)*	2.70 *(4.20)*
22	44A081X-22-Y	19 × 34	.062 *(1.57)*	3.90 *(5.80)*
20	44A081X-20-Y	19 × 32	.070 *(1.78)*	5.50 *(8.18)*
18	44A081X-18-Y	19 × 30	.080 *(2.03)*	8.00 *(11.91)*
16	44A081X-16-Y	19 × 29	.089 *(2.26)*	10.10 *(15.03)*
14	44A081X-14-Y	19 × 27	.108 *(2.74)*	15.50 *(23.07)*
12	44A081X-12-Y	37 × 28	.126 *(3.20)*	23.00 *(34.23)*
10	44A081X-10-Y	37 × 26	.155 *(3.94)*	35.70 *(53.13)*
8	44A081X-8-Y	133 × 29	.214 *(5.44)*	62.80 *(93.46)*
6	44A081X-6-Y	133 × 27	.264 *(6.71)*	99.30 *(147.77)*
4	44A081X-4-Y	133 × 25	.320 *(8.13)*	153.00 *(227.69)*
2	44A081X-2-Y	665 × 30	.400 *(10.16)*	247.00 *(367.58)*
0	44A081X-0-Y	1045 × 30	.490 *(12.45)*	377.00 *(561.09)*
Normal weight				
600-volt 44A071X[a] .020-inch wall thickness				
26	44A071X-26-Y	19 × 38	.053 *(1.35)*	2.20 *(3.27)*
24	44A071X-24-Y	19 × 36	.057 *(1.45)*	3.00 *(4.46)*
22	44A071X-22-Y	19 × 34	.069 *(1.75)*	4.30 *(6.40)*
20	44A071X-20-Y	19 × 32	.078 *(1.98)*	6.10 *(9.08)*
18	44A071X-18-Y	19 × 30	.088 *(2.24)*	8.70 *(12.95)*
16	44A071X-16-Y	19 × 29	.097 *(2.46)*	10.90 *(16.22)*
14	44A071X-14-Y	19 × 27	.115 *(2.92)*	16.20 *(24.11)*
12	44A071X-12-Y	37 × 28	.131 *(3.33)*	24.20 *(36.01)*
10	44A071X-10-Y	37 × 26	.161 *(4.09)*	36.50 *(54.32)*
8	44A071X-8-Y	133 × 29	.219 *(5.56)*	65.00 *(96.73)*
6	44A071X-6-Y	133 × 27	.269 *(6.83)*	103.00 *(153.28)*
4	44A071X-4-Y	133 × 25	.325 *(8.26)*	158.00 *(235.13)*
2	44A071X-2-Y	665 × 30	.404 *(10.26)*	252.00 *(375.02)*
0	44A071X-0-Y	1045 × 30	.494 *(12.55)*	380.00 *(565.50)*

[a] X = conductor type (see Part Numbering System on page 10-2)

[b] Y = color as specified

* Color code:
0 = Black
1 = Brown
2 = Red
3 = Orange
4 = Yellow
5 = Green
6 = Blue
7 = Violet
8 = Gray
9 = White

[c] Weight is for tin-coated copper conductor.

Construction	Number of components	Component conductor[a]	Jacket material	Shield material[a]	Cable part numbers[b] Light wt.	Medium wt.
Unshielded, unjacketed 	2–9	1			44A01X1-	44A08X1-
		2			44A01X2-	44A08X2-
		3			44A01X3-	44A08X3-
		4			44A01X4-	44A08X4-
Unshielded, jacketed 	2–9	1	Radiation-crosslinked polyvinylidene fluoride (PVDF)		44AM41X1-	44AM48X1-
		2			44AM41X2-	44AM48X2-
		3			44AM41X3-	44AM48X3-
		4			44AM41X4-	44AM48X4-
		1	Radiation-crosslinked modified ethylene tetrafluoroethylene (ETFE)		44B41X1-	44B48X1-
		2			44B41X2-	44B48X2-
		3			44B41X3-	44B48X3-
		4			44B41X4-	44B48X4-
Shielded (round braid), unjacketed 	1–9	1		1	44AM31X1-	44AM38X1-
		2		2	44AM31X2-	44AM38X2-
		3		3	44AM31X3-	44AM38X3-
		4		1	44AM31X4-	44AM38X4-
Shielded (round braid), jacketed 	1–9	1	Radiation-crosslinked PVDF	1	44AM11X1-	44AM18X1-
		2		2	44AM11X2-	44AM18X2-
		3		3	44AM11X3-	44AM18X3-
		4		1	44AM11X4-	44AM18X4-
		1	Radiation-crosslinked modified ETFE	1	44B11X1-	44B18X1-
		2		2	44B11X2-	44B18X2-
		3		3	44B11X3-	44B18X3-
		4		1	44B11X4-	44B18X4-
Shielded (flat braid), jacketed 	1–9	1	Radiation-crosslinked PVDF	1	44AM21X1-	44AM28X1-
		2		1	44AM21X2-	44AM28X2-
		3		1	44AM21X3	44AM28X3-
		4		1	44AM21X4-	44AM28X4-
		1	Radiation-crosslinked modified ETFE	1	44B21X1-	44B28X1-
		2		1	44B21X2-	44B28X2-
		3		1	44B21X3-	44B28X3-
		4		1	44B21X4-	44B28X4-

[a] Type of conductor or shield material:
1 = tin-coated copper
2 = silver-coated copper
3 = nickel-coated copper
4 = silver-coated high-strength copper alloy

[b] X = Number of components in cable. For complete part number see Part Numbering System on page 10-2.

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M27500 - AWG XX X X XX

Jacket style and material. 00 = no jacket; 08 = crosslinked, white PVDF; 23 = crosslinked, white, modified ETFE.

Shield style and material. U = no shield; T = tin-coated copper, round; J = tin-coated copper, flat; S = silver-coated copper, round; G = silver-coated copper, flat; N = nickel-coated copper, round.

Number of components. 1 through 9; 10 components = 0.

Basic wire spec (MIL-W-81044) and slash sheet. Slash sheet: MD = /5; ME = /6; MF = /7; MG = /8; MH = /9; MJ = /10; MK = /11; ML = /12; MM = /13.

Example: M27500-22ML3T08 = 44AM1131-22-9/96/93-9

Military part no.

Raychem part no.

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