

# SPEC 55

High-performance wire and cable insulation system for -65°C to 200°C

**Fax-on-Demand:** (800) 260-9099  
(650) 361-6523

FAX ID	Description
6010	Data sheet
6250	RT-Spec 55A

**Before ordering check with factory for most current data.**



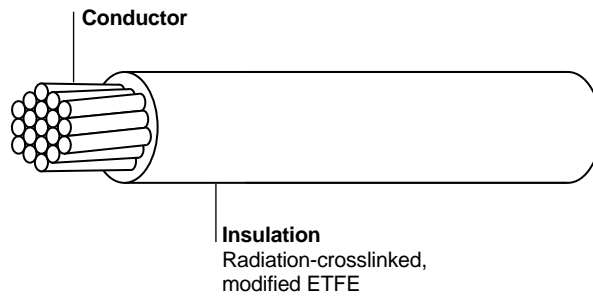
### Applications

SPEC 55 wire is currently used on numerous aircraft programs and increasingly for industrial applications where a high temperature rating is required. Chosen for its balance of properties, SPEC 55 wire has outstanding resistance to chemicals and solvents, offers excellent electrical arc track resistance, and is not susceptible to UV and moisture degradation.

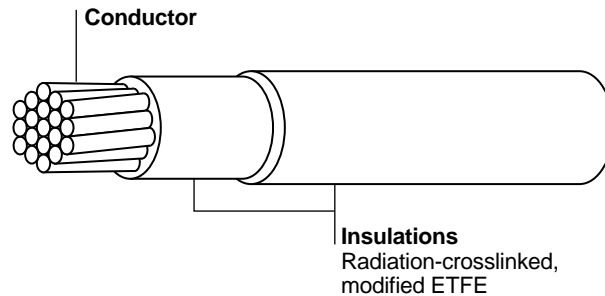
### Features/Benefits

- Resistant to electrical arc tracking in wet or dry conditions.
- Single- or dual-wall construction.
- Small size, ultralight weight.
- Exceptional chemical resistance.
- -65°C to 200°C.

### SPEC 55 Insulation System—Single Wall



### SPEC 55 Insulation System—Dual Wall



## Specifications/Approvals

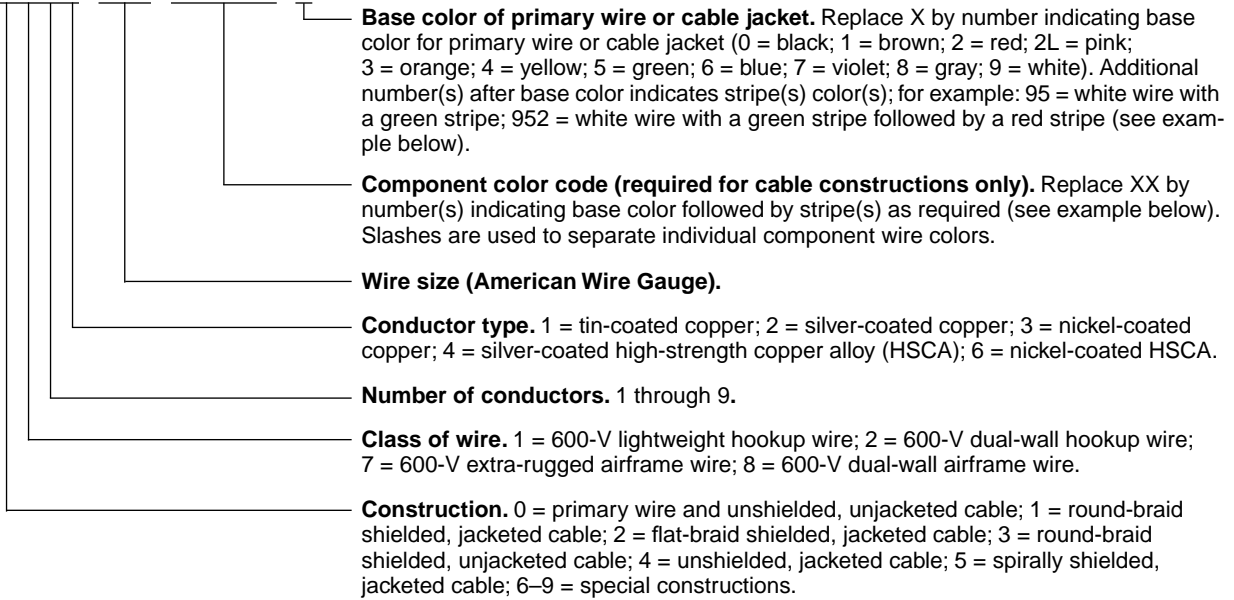
Military	Industry	Agency	Raychem
MIL-W-22759/32–35 and /41–46 MIL-C-27500 (cables)	Civil Aviation Authority Accessory Approval E11749	NASA preferred product list	SPEC 55
Def. Stan. 61-12, Part 33, Types 1 and 2	Boeing material specification (BMS) 13-48	European Space Agency 3901/012	
Def. Stan. 61-12, Parts 29 and 33 British Standard G233 VG95218	Airbus ABS 0820 to 0826		

## Typical Properties

	Typical value	Test method
<b>Electrical</b>		
Dielectric breakdown .254 mm (.010 in)	27 kV	ASTM D 3032
Volume resistivity (ohm-cm)	10 <sup>16</sup>	ASTM D 257
Dielectric constant (permittivity)	2.7	ASTM D 150
Dissipation factor	.001	ASTM D 150
Insulation resistance megohms/km ( <i>megohms/1000 ft</i> )	1500/5000	M22759/34
<b>Physical</b>		
Tensile strength (N/mm <sup>2</sup> /psi)	41–55/ 6,000–8,000	M22759/34
Elongation (%):		
Primary insulation (core)	170	M22759/34
Overall	100	M22759/34
Electrical arc tracking	Pass	ASTM D 3032
<b>Flammability</b>		
Oxygen index (%)	40	ASTM 2863
Vertical flame test:		
Afterburn (sec)	0	Raychem SPEC 55
Burn length (mm/in)	57/2.25	Raychem SPEC 55
<b>Thermal properties</b>		
Crosslinking proof test (7 h at 300°C)	Pass	M22759/34
Cold bend (–65°C)	Pass	M22759/34
<b>Chemical resistance</b>		
Water absorption (%)	.03	ASTM D 570
Hydrolytic stability	Will not hydrolyze	ASTM D 570
Fluid immersion	Pass	M22759/34
<b>Mechanical*</b>		
Dynamic cut-through (kg/lb)	25/45	Raychem SPEC 55
Scrape abrasion (cycles)	75	Raychem SPEC 55
Crush resistance (kg/lb)	61/135	1.57-mm/.062-inch-diameter mandrel
Impact resistance (kg/lb)	6/14.2	ASTM D 256 (.031 rad, 1 ft-lb arm)

\*Mechanical tests performed at room temperature on dual-wall 20 AWG SPEC 55 wire (55A0811-20).

55 A X X X X - AWG - XX/XX/XX - X



**Example:** 55A1131-22-9/96/93-9

Round-braid shielded, jacketed cable with three components of 600-V lightweight hookup wire that is 22 AWG tin-coated copper. Components are coded white, white with a blue stripe, and white with an orange stripe, with an overall white, crosslinked, modified ETFE jacket.

SPEC 55 Part Numbering System

Temperature rating	Conductor material	AWG range available	Raychem part no.	MIL-SPEC no.
<b>600-V lightweight single-wall hookup wire, .152 mm (.006 inch) nominal wall</b>				
150°C	Tin-coated copper	12–30	55A0111	M22759/32
200°C	Silver-coated copper	12–28	55A0112	M22759/44
200°C	Nickel-coated copper	12–28	55A0113	M22759/45
200°C	Silver-coated high-strength alloy	20–30	55A0114	M22759/33
200°C	Nickel-coated high-strength alloy	20–28	55A0116	M22759/46
<b>600-V lightweight dual-wall airframe wire, .203 mm (.008 inch) nominal wall</b>				
150°C	Tin-coated copper	6–26	55A0211	
200°C	Silver-coated copper	10–26	55A0212	
200°C	Nickel-coated copper	10–26	55A0213	
200°C	Silver-coated high-strength alloy	18–30	55A0214	
200°C	Nickel-coated high-strength alloy	16–26	55A0216	
<b>600-V dual-wall airframe wire, .254 mm (.010 inch) nominal wall</b>				
150°C	Tin-coated copper	00–24	55A0811	M22759/34
200°C	Silver-coated copper	00–26	55A0812	M22759/43
200°C	Nickel-coated copper	00–26	55A0813	M22759/41
200°C	Silver-coated high-strength alloy	20–26	55A0814	M22759/35
200°C	Nickel-coated high-strength alloy	20–26	55A0816	M22759/42
<b>600-V medium-weight dual-wall airframe wire, .381 mm (.015 inch) nominal wall</b>				
150°C	Tin-coated copper	10–24	55A0711	
200°C	Silver-coated copper	16–24	55A0712	
200°C	Nickel-coated copper	16–24	55A0713	
200°C	Silver-coated high-strength alloy	16–24	55A0714	
200°C	Nickel-coated high-strength alloy	16–26	55A0716	

**Product Dimensions (SPEC 55 Primary Wire)**

Wire size (AWG)	Raychem part number <sup>a,b</sup>	Conductor stranding (no. × AWG)	Nominal diameter in mm/in		Max. weight in kg/km (lb/1000 ft) <sup>c</sup>	
<b>Hookup wire 600-V 55A011X<sup>a</sup> .152 mm (.006 inch) wall thickness</b>						
30	55A011X-30-Y	7 × 38	.61	(.024)	.98	(.66)
28	55A011X-28-Y	7 × 38	.69	(.027)	1.35	(.91)
26	55A011X-26-Y	19 × 38	.81	(.032)	2.08	(1.4)
24	55A011X-24-Y	19 × 36	.94	(.037)	2.98	(2.0)
22	55A011X-22-Y	19 × 34	1.09	(.043)	4.17	(2.8)
20	55A011X-20-Y	19 × 32	1.27	(.050)	6.40	(4.3)
18	55A011X-18-Y	19 × 30	1.52	(.060)	9.67	(6.5)
16	55A011X-16-Y	19 × 29	1.73	(.068)	12.35	(8.3)
14	55A011X-14-Y	19 × 27	2.16	(.085)	19.35	(13.0)
12	55A011X-12-Y	37 × 28	2.62	(.103)	29.30	(19.7)

<b>Airframe wire 600-V 55A081X<sup>a</sup> .254 mm (.010 inch) wall thickness</b>						
26	55A081X-26-Y	19 × 38	1.02	(.040)	2.53	(1.7)
24	55A081X-24-Y	19 × 36	1.14	(.045)	3.42	(2.3)
22	55A081X-22-Y	19 × 34	1.27	(.050)	4.76	(3.2)
20	55A081X-20-Y	19 × 32	1.47	(.058)	6.99	(4.7)
18	55A081X-18-Y	19 × 30	1.78	(.070)	10.71	(7.2)
16	55A081X-16-Y	19 × 29	1.96	(.077)	13.39	(9.0)
14	55A081X-14-Y	19 × 27	2.39	(.094)	20.54	(13.8)
12	55A081X-12-Y	37 × 28	2.82	(.111)	30.51	(20.5)
10	55A081X-10-Y	37 × 26	3.40	(.134)	48.22	(32.4)
8	55A081X-8-Y	133 × 29	4.95	(.195)	89.74	(60.3)
6	55A081X-6-Y	133 × 27	6.12	(.241)	140.63	(94.5)
4	55A081X-4-Y	133 × 25	7.87	(.310)	223.22	(150.0)
2	55A081X-2-Y	665 × 30	10.36	(.408)	370.0	(239.0)
1	55A081X-1-Y	817 × 30	11.94	(.470)	483.60	(290.0)
0	55A081X-0-Y	1045 × 30	12.95	(.510)	569.90	(377.0)
00	55A081X-00-Y	1330 × 30	14.78	(.570)	744.00	(487.0)

**Note:** MIL-W-22759 requires a fabric overbraid on 2 through 00 AWG; special Raychem part numbers are assigned to these MIL-SPEC constructions.



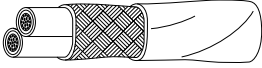
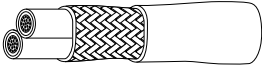
<sup>a</sup>X = conductor type (see Part Numbering System on previous page).

<sup>b</sup>Y = color as specified (see color code below):

0 = Black	3 = Orange	7 = Violet
1 = Brown	4 = Yellow	8 = Gray
2 = Red	5 = Green	9 = White
2L = Pink		

<sup>c</sup>Weight is for tin-coated copper conductor.

**SPEC 55 Cable Constructions**

Construction	Number of components	Component conductor <sup>a</sup>	Shield material <sup>a</sup>	Part number	
				Light wt. <sup>b</sup>	Medium wt.
Unshielded, unjacketed 	2-9	1		55A01X1-AWG-Y	55A08X1-AWG-Y
		2		55A01X2-AWG-Y	55A08X2-AWG-Y
		3		55A01X3-AWG-Y	55A08X3-AWG-Y
		4		55A01X4-AWG-Y	55A08X4-AWG-Y
		6		55A01X6-AWG-Y	55A48X6-AWG-Y
		6		55A01X6-AWG-Y	55A48X6-AWG-Y
Unshielded, jacketed 	2-9	1		55A41X1-AWG-Y	55A48X1-AWG-Y
		2		55A41X2-AWG-Y	55A48X2-AWG-Y
		3		55A41X3-AWG-Y	55A48X3-AWG-Y
		4		55A41X4-AWG-Y	55A48X4-AWG-Y
		6		55A41X6-AWG-Y	55A18X6-AWG-Y
		6		55A41X6-AWG-Y	55A18X6-AWG-Y
Shielded (round braid), jacketed 	1-9	1	1	55A11X1-AWG-Y	55A18X1-AWG-Y
		2	2	55A11X2-AWG-Y	55A18X2-AWG-Y
		3	3	55A11X3-AWG-Y	55A18X3-AWG-Y
		4	1	55A11X4-AWG-Y	55A18X4-AWG-Y
		6	3	55A11X6-AWG-Y	55A18X6-AWG-Y
		6	3	55A11X6-AWG-Y	55A18X6-AWG-Y
Shielded (flat braid), jacketed 	1-9	1	1	55A21X1-AWG-Y	55A28X1-AWG-Y
		2	1	55A21X2-AWG-Y	55A28X2-AWG-Y
		3	1	55A21X3-AWG-Y	55A28X3-AWG-Y
		4	1	55A21X4-AWG-Y	55A28X4-AWG-Y
		6	1	55A21X6-AWG-Y	55A28X6-AWG-Y
		6	1	55A21X6-AWG-Y	55A28X6-AWG-Y

<sup>a</sup>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  
 6 = nickel-coated high-strength copper alloy

<sup>b</sup>X = no. of wire components  
 Y = color code  
 For complete part number, see Part Numbering System on page 10-10.

**MIL-C-27500 Cable Part Numbering System**

**M27500 - AWG XX X X XX**

**Jacket style and material**

00 = no jacket  
 23 = crosslinked, modified ETFE, white  
 73 = double jacket crosslinked, modified ETFE, white

**Shield material and style**

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; V = tin-coated copper, round, double shield  
 W = silver-coated copper, round, double shield

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

**Basic wire spec (MIL-W-22759) and slash sheet**

SB = 32 = 55A0111; SC = 33 = 55A0114; SD = 34 = 55A0811; for 2 AWG and larger, use 55A8039  
 SE = 35 = 55A0814; SM = 41 = 55A0813; for 2 AWG and larger, use 55A8595  
 SN = 42 = 55A0816; SP = 43 = 55A0812; for 2 AWG and larger, use 55A6089; SR = 44 = 55A0112  
 SS = 45 = 55A0113; ST = 46 = 55A0116

**Example:**

M275001-20SB3T23 = 55A1131-20-9/96/93-9

Military part no. \_\_\_\_\_

Raychem part no. \_\_\_\_\_

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