

SPEC 44 High Performance Wire and Cable with PVDF coat

- Dual Wall Construction
- Very Light Weight
- Small Diameter due to very precisely extruded cross-linked PVDF coat
- Resistant to most chemicals and electrical arc tracking
- Space and weight saving



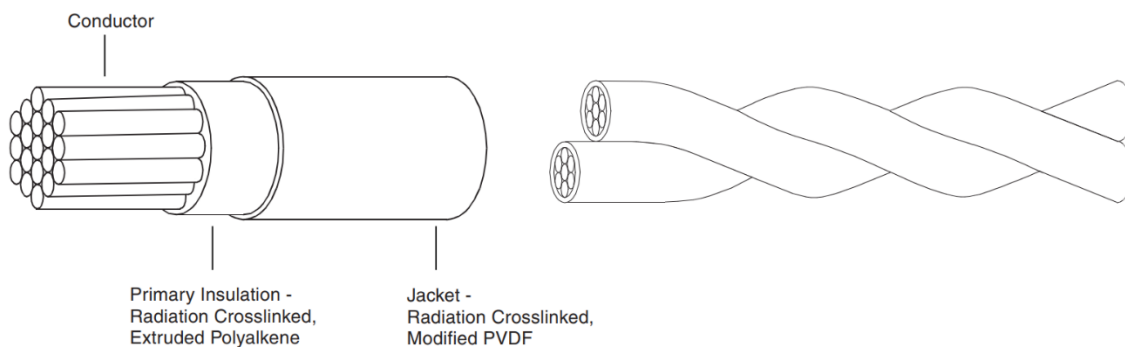
SPEC 44 wire has a dual wall construction which combines the outstanding physical and electrical characteristics of radiation crosslinked polyalkene with the excellent mechanical and chemical properties of radiation cross-linked polyvinylidene fluoride (PVDF).

The result is a wire insulation system that offers a 150°C [302°F] temperature rating, small size, light weight, solder iron resistance, and resistance to most solvents, fuels and lubricants.

SPEC 44 wire and cable is highly flame retardant, non-melting, does not cold flow, and though mechanically very tough, is easy to handle and install using conventional tools.

Originally developed for aerospace and military requirements in applications of high density and complex circuitry, SPEC 44 wire and cable now finds wide use throughout industry, in commercial and military electronics, avionics, on satellites, aircraft, helicopters, ships, trains, military ground systems, and offshore plat-forms where environmental conditions demand consistently reliable performance.

In airframe applications SPEC 44 constructions can offer a modern dimensional replacement for PVC/Nylon/ Glass braid type wire and cables. SPEC 44 wire is offered in a wide range of sizes in stranded conductors, standard materials available being tin or silver-plated copper and high strength copper alloy. Voltage ratings of 600, 1000 and 2500 volts are available as standard. Shielded and jacketed versions include single and multi-conductor constructions and flat braid shields where further size and weight savings are achieved.



Physical Characteristics

Small Size

SPEC 44 equipment wire, 600 volt rated has a 0.19 [.008] nominal wall thick-ness compared to 0.25 [.010] and 0.38 [.015] for equivalent PTFE and PVC wires in MIL-DTL-16878, SAE AS22759 or BS 3G210.

Light Weight

Because of the thin wall and low density of the insulation materials considerable weight savings are made over similarly rated PTFE wires.

General Handling

The flexibility of SPEC 44 and the ease with which it takes a 'set' makes it one of the easiest of the 'high performance' wires to install. Stripping is done with conventional die blade strippers.

The tin-plated conductor usually specified is easily soldered or crimped. The insulation may be easily printed and does not need etching before potting.

Lengths

SPEC 44 is available in long continuous lengths and can be supplied for use on automatic cut and strip wire preparation machines.

Specifications / Approvals

- AS-81044, NEMA-WC-27500 (Cables)
- Def Stan. 61-12 Part 18 – Type 1 pliable (Maintenance Range)
- Def Stan. 61-12 Part 26 – All Types
- VG 95218 Parts 20, 21, 22, 23 and 1000
- NATO Stock Numbers (NSN's) exist for most standard constructions
- Civil Aviation Authority Accessory Approval E11623
- TE Specification 44

Typical Properties

Temperature rating	-65°C to +150°C
Voltage rating thin wall	600 V
Voltage rating thick wall	2500V
Tensile strength and elongation of insulation	28 N/mm ² (4000 PSI) 230%
Notch propagation, 0.05mm notch	Pass
Solder iron resistance (370°C, 1 minute)	Pass
Shrinkage, 300°C	<1%
Low temperature bend	-65°C
Voltage withstand thin wall	2500 V
Resistance: fuels, oils, solvents	Pass

Environmental Performance

Temperature Rating

SPEC 44 wire and cable is rated for continuous operation from -65°C to +150°C and for short periods at temperatures as high as +300°C. Heat ageing tests are routinely performed at temperatures of +200°C (168 hr) and +300°C (6 hr). In addition SPEC 44 insulation will not shrink back under repeated cycling.

Mechanical Performance

SPEC 44 wire provides better cut through resistance than some wires with much thicker walls. 600 volt equipment wire 44A01111 (0.19 mm wall) has 40% greater cut through resistance than 600 volt PTFE insulated wire (0.25 mm wall).

Solder Iron / Overload Resistance

The radiation crosslinking of the materials used in SPEC 44 makes them non-melting at high temperature. As a result SPEC 44 wire resistant to prolonged contact with solder irons and is resistant to current overloads which would melt most thermoplastic insulation.

Chemical Resistance

The irradiated dual wall construction of SPEC 44 wire is highly resistant to many acids, alkalis, hydrocarbon solvents, fuels, lubricants, water and many missile fuels and oxidizers.

Cold Flow

Radiation cross-linking of SPEC 44 prevents cold flow of the insulation – a recognized problem of some uncrosslinked materials.

Voltage Ratings

Standard available voltage rating for SPEC 44 wire are 600 volts (0.19 mm wall thickness), 1000 volts (0.28 mm wall) and 2500 volts (0.48 mm wall).

Electrical Arc Track Resistance

SPEC 44 insulation demonstrates a resistance to arc tracking under both wet and dry conditions at aircraft system voltages.

Low Outgassing

For use in space applications, special constructions of SPEC 44 wire are available with low outgassing characteristics, for use in an environment of high vacuum and high temperature.

Fire Hazard Performance

Flammability	Federal Aviation Reg FAR-25	Pass
	BS EN 50265 vertical Flammability	Pass
	S424 14751 (Swedish chimney)	Pass
	NFC 32070 (2) (French chimney)	Pass
	IEC 60332 part 3 (Cable ladder)	Pass
Smoke/Toxicity Index	Smoke Index, Def Stan 61-12 (18)	6 per meter of wire
	Toxicity Index, Def Stand 61-12 (18)	0.8 per meter of wire
	BS EN 150-4589 Part 2	30% Oxygen
	BS EN 150-4589 Part 3	
	Temperature Index, NES 715	>300°C

Wärmeschumpftechnik

Primary Wires / Twisted Pair			44A011X (600V)		44A021X (1000V)		44A031X (2500V)	
Wire Size (AWG)	Stranding (mm)	CSA (mm ²)	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.
30	7/0.10	0.06	0.68	1.06	0.81	1.34	-	-
28	7/0.13	0.09	0.76	1.43	0.89	1.64	-	-
26*	19/0.10	0.15	0.86	2.08	1.02	2.38	1.35	3.13
24	19/0.13	0.25	1.02	2.98	1.17	3.57	1.44	4.46
22	19/0.16	0.4	1.19	4.46	1.37	5.2	1.75	6.4
20	19/0.20	0.6	1.4	6.7	1.57	7.59	1.98	9.08
18	19/0.25	1	1.65	10.12	1.85	11.46	2.23	12.95
16	19/0.29	1.25	1.83	12.8	2.06	14.58	2.46	16.22
14	19/0.36	2	2.26	19.64	2.49	21.88	2.92	24.1
12	37/0.32	3	2.74	30.06	2.97	32.89	3.32	36.01
10	37/0.40	5	3.28	46.26	3.71	52.98	4.09	54.32
8	133/0.29	8.3	-	-	5.23	91.97	96.2	96.73

*for 44A0211-26 the stranding is 7/0.16mm

Primary Wires / Twisted Pair			44A081X (600V)		44A012X (600V)	
Wire Size (AWG)	Stranding (mm)	CSA (mm ²)	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.
30	7/0.10	0.06	-	-	1.37	2.38
28	7/0.13	0.09	-	-	1.52	3.13
26*	19/0.10	0.15	1.22	2.98	1.73	4.31
24	19/0.13	0.25	1.37	3.87	2.03	6.39
22	19/0.16	0.4	1.57	5.65	2.38	9.37
20	19/0.20	0.6	1.78	8.04	2.79	13.98
18	19/0.25	1	2.03	11.91	3.3	21.27
16	19/0.29	1.25	2.26	14.73	3.65	26.93
14	19/0.36	2	2.74	22.17	4.52	42.25
12	37/0.32	3	3.2	32.59	5.48	65.91
10	37/0.40	5	3.94	52.08	-	-
8	133/0.29	8.3	92.94	93.46	-	-

Shielded and Jacketed Cable		44A111X (600V)		44A121X (1000V)		44A181X (600V)		44A112X (600V)	
Wire Size (AWG)	Stranding (mm)	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.	Outside ϕ (mm)	Weight (g/m) max.
30	7/0.10	1.54	5.21	-	-	-	-	2.23	8.2
28	7/0.13	1.61	5.8	-	-	-	-	2.38	9.4
26	19/0.10	1.57	6.84	1.73	6.85	-	-	2.59	12.05
24	19/0.13	1.83	8.63	1.98	9.67	2.26	11.76	2.99	16.82
22	19/0.16	2.01	10.71	2.24	12.35	2.57	15.48	3.35	21.57
20	19/0.20	2.26	14.73	2.54	17.41	2.77	19.19	3.76	27.97
18	19/0.25	2.62	20.68	2.82	22.62	3.02	24.11	4.32	38.24
16	19/0.29	2.79	24.55	3.02	26.64	3.25	28.13	4.67	44.94
14	19/0.36	3.22	34.08	3.45	36.16	3.73	38.69	5.53	64.28
12	37/0.32	3.7	47.77	4.14	49.56	4.19	52.38	6.5	91.51

Part Numbering System

44 - X - X - X - X - X - X - AWG - X/X - X

