

Chapter 6

TERSIL CABLES

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Introduction

1 Tersil cables are round flexible cables with a glass fibre braid applied over a basic silicone rubber insulation. The exterior of the cable is coloured orange. The conductors are of copper (Tersil cables) or aluminium (Tersilal cables). These cables are used for general airframe wiring in an operating temperature range from -75 °C to +190 °C; it should be noted that the cables are not suitable for severe flexing below -55 °C. The cables with copper conductors will withstand a 5 minute period at 1100 °C and are thus suitable for circuits which must operate during or after a fire; it should be noted however that at temperatures above 105 °C certain cable terminations may be unsatisfactory. The cables are suitable for use where the potential between conductors, or between a conductor and screen or the aircraft structure does not exceed 600 volts (rms) and the frequency does not exceed 1600 Hz.

2 The cables are resistant to all fluids used on aircraft including ester based fluids; they will withstand splash conditions from high test peroxide. Resistance may be impaired if the protective covering is cut because there is a tendency for the silicone rubber to absorb kerosene, if present, and to swell and burst through the protective cover. Therefore, the ends of the cables should, if possible, be kept away from areas where they would be exposed to kerosene; where this cannot be ensured, special protection should be provided.

Specification

3 Tersil type cable complies with British Standard G189 and MIL-W-8777. The cables does not support combustion: it complies with BS 2G 100 Part 2, Sect 3.

Identification

4 The cable identification group follows the format of Chap 1 para 2 and is printed on the outermost surface. The cable name is as stated in the appropriate para 5 to 9 of this chapter.

CABLE TYPESTersil (fig 1)

5 The conductor is of stranded or rope stranded nickel plated copper with an insulation of silicone rubber covered with a protective fibre glass braid or other suitable protection. There may be an inner glass fibre braid under the silicone rubber. The outer cover is coloured orange, usually varnished.

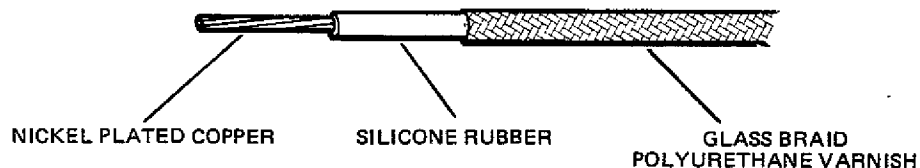


Fig 1 Tersil cable

Tersilmet (fig 2)

6 These cables are similar to Tersil but with the addition of a tinned copper braid screen.



Fig 2 Tersilmet cable

Tersilmetsheath (fig 3)

7 These cables are similar to Tersilmet but with the addition of a layer of polyester tape followed by a glass and/or polyester fibre braid.

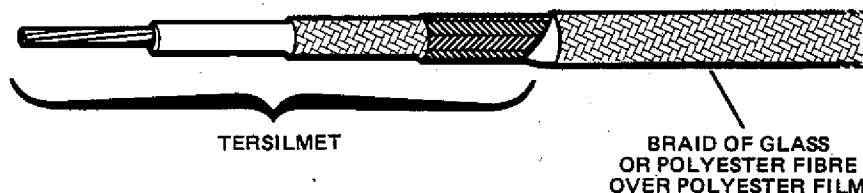


Fig 3 Tersilmetsheath cable

Du-, tritersil cables

8 Tersil cables are also manufactured with two or three cables twisted together to form Dutersil or Tritersil. Such cables have their cores marked with a helical red, yellow and (for Tritersil) a blue stripe for phase identification.

Tersilal

9 A type of Tersil but with an aluminium conductor is also manufactured. The construction over the conductor is identical with Tersil but results in a lighter cable for an equivalent current carrying capacity. It is produced in AWG code sizes 8 to 0000. Du- and tritersilal cables are also produced with helical identifying stripes as para 8.

Cable size and properties

10 Tables 1 and 2 list all Tersil type cables together with various electrical properties and a reference number where allocated. It should be noted that Tersil type cable is sized using the American Wire Gauge (AWG) system; this information is included in the table for cross-reference purposes only. If there is any doubt concerning the exact conductor dimensions when fitting terminations, then the cable must be measured and the circular mil area (CMA) or cross-sectional area (CSA) must be calculated as in Chapter 1, para 8.

TABLE 1 TERSIL CABLE TYPES

<u>Cable type</u>					
AWG size code	Number and nominal diam of conductor wires (mm)	Overall cable diam min/max (mm)	Nominal mass (g/m)	Maximum resistance at 20 °C (ohm/km)	Sect/Ref No or NATO No: 6145-99-
<u>Tersil cable</u>					
22	19/0.15	2.0 - 2.3	6.6	55.18	1048900
20	19/0.19	2.3 - 2.5	10	34.39	9467180
18	33/0.19	2.7 - 2.9	13.3	19.8	9489910
16	40/0.19	2.9 - 3.3	20	16.3	9994047
14	70/0.19	3.4 - 3.8	30	9.3	1056078
12	111/0.19	3.9 - 4.3	43.3	5.9	9468202
10	73/0.31	4.7 - 5.1	60	3.6	9708181
8	120/0.31	6.0 - 6.5	103.3	2.2	9467178
6	182/0.31	7.4 - 7.9	163.3	1.4	1051386
4	294/0.31	8.9 - 9.4	253.3	0.89	7149714
2	203/0.46	10.8 - 11.3	373.3	0.57	4466370
1	248/0.46	11.9 - 12.6	460	0.47	4466371
0	323/0.46	13.3 - 14	580	0.36	4466372
00	416/0.46	14.7 - 15.5	743.3	0.28	1047325
000	513/0.46	16.5 - 17.3	906.7	0.23	4466373
0000	666/0.46	18.3 - 19.1	1176.7	0.17	1047324

(continued)

TABLE 1 TERSIL CABLE TYPES (continued)

<u>Cable type</u>					
AWG size code	Number and nominal diam of conductor wires (mm)	Overall cable diam min/max (mm)	Nominal mass (g/m)	Maximum resistance at 20 °C (ohm/km)	Sect/Ref No or NATO No: 6145-99-
<u>Unitersilmet cable</u>					
22	19/0.15	2.5 - 2.9	20	55.2	4466385
20	19/0.2	2.8 - 3.2	23.3	34.4	9467179
18	33/0.19	3.2 - 3.6	26.7	19.8	4466386
16	40/0.19	3.7 - 4.3	36.7	16.3	4466387
14	70/0.19	4.2 - 4.8	43.3	9.34	
12	110/0.19	4.7 - 5.3	73.3	5.94	4466389
10	73/0.3	5.5 - 6.1	103.3	3.59	
8	120/0.3	6.7 - 7.5	150	2.19	9468200
<u>Unitmerilmethsheath cable</u>					
22	19/0.15	2.9 - 3.6	20	55.2	4466440
20	19/0.2	3.2 - 3.8	23.3	34.4	9711764
18	33/0.19	3.6 - 4.2	30	19.8	4466441
16	40/0.19	4.1 - 4.8	40	16.3	9708182
<u>Unitsilal cables</u>					
8	41/0.51	6.1 - 6.6	47.3	3.64	
6	70/0.51	7.7 - 8.3	77	2.13	
4	105/0.51	9.3 - 9.8	111.3	1.42	
2	168/0.51	11.3 - 11.8	180	0.89	
0	266/0.51	13.8 - 14.5	253.3	0.56	
00	342/0.51	15.2 - 16	300	0.44	
000	418/0.51	17.1 - 17.9	373.3	0.36	
0000	532/0.51	18.9 - 19.7	490	0.28	

TABLE 2 TERSIL CABLE CURRENT RATING

AWG size code	Maximum continuous rating		Maximum 5 min rating		Maximum 1 min rating	
	Single cable in free air (amps)	3 bunched cables in free air (amps)	Single cable in free air (amps)	3 bunched cables in free air (amps)	Single cable in free air (amps)	3 bunched cables in free air (amps)
22	9.5	6	10.5	7	13	10.5
20	12	8	14	10.5	19	17
18	16	11.5	20	15	26	23
16	18	13	22	17	29	25
14	27	21	32	25	44	41
12	38	26	44	33	63	59
10	48	37	52	46	81	79
8	70	52	79	67	133	127

(continued)

TABLE 2 TERSIL CABLE CURRENT RATING (continued)

AWG size code	Maximum continuous rating		Maximum 5 min rating		Maximum 1 min rating	
	Single cable in free air (amps)	3 bunched cables in free air (amps)	Single cable in free air (amps)	3 bunched cables in free air (amps)	Single cable in free air (amps)	3 bunched cables in free air (amps)
6	100	76	125	107	220	206
4	140	105	200	165	340	330
2	175	135	270	230	475	465
1	195	145	290	260	545	525
0	210	165	320	305	615	605
00	240	185 210*	370	360	720	715
000	260	205 230*	410	405	850	840
0000	290	230 260*	470	490	1100	1090

* The higher rating is for two cables

NOTE

These current ratings are based on a temperature rise of 40 °C from an ambient temperature of 150 °C. The maximum permissible conductor temperature is 190 °C.

The actual value can be obtained by multiplying the rating by the following factors:

Ambient Temperature (°C)	Multiplying Factor
150	1
160	0.85
170	0.7
180	0.5

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