Chapter 4

PREN CABLES

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Introduction

1. Pren cables are designed for general aircraft electrical wiring where the potential between conductors does not exceed 250 volts (R.M.S.), 1,600 c/s. They are so constructed that they will withstand a higher temperature rise than the earlier types of cable, which effects a saving in the overall weight and bulk of cable used; in addition, they have a higher resistance to the effects of fire, fuels, lubricants, hydraulic fluids, etc. In low temperature zones, Pren cables are suitable for use under flexing conditions down to temperatures of —30 deg. C.; if aircraft vibration only is present, they are suitable for use down to —75 deg. C.

DESCRIPTION

2. The range of single-core Pren cables available is listed in Table 1, and multi-core cables in Table 2, which also gives details of construction. Typical cables are illustrated in fig. 1.

3. The core of each type consists of a conductor covered with insulation of glass braid, over which is an outer layer of synthetic rubber compound of the polychloroprene class. Polychloroprene does not support combustion, and the inner glass braid provides for short emergency service after the polychloroprene has been rendered inoperative as an insulant either by mechanical damage or incineration.

Note . .

The word "Pren" is merely an abbreviation of "Polychloroprene," which is the full chemical name for the synthetic rubber used as the insulating medium for these particular cables. Other names for "Polychloroprene" in common use are "P.C.P." and "Neoprene."

Pren

4. Single-core Pren cables consist of a conductor of stranded tinned copper wires, with an insulant of glass braiding and poly-

chloroprene. Multi-core cables are circular, polychloroprene fillings being used to maintain a good shape; the cores are covered with a further layer of glass braid, lacquered with a fire-, heat- and oil-resisting composition.

Prenal

5. Prenal cables, of which only a single-core version is available, are similar to Unipren cables in construction except that the conductor is of aluminium.

Prenmet

6. These cables are Pren cables, to which has been added an outer layer of tinned copper braiding. Otherwise they are constructed in a similar manner to the Pren cables, and may be single- or multi-core.

Prensheath

7. Prensheath cables consist of insulated Pren cores sheathed with polychloroprene; polychloroprene fillings may be used to maintain a good shape. These cables may be twin- or multi-core.

TABLE I

Range of single-core Pren cables

Cable	Stores Ref.	Overall dia. (in.) (max.)	Resistance at 60 deg. F. (ohms per 1,000 yd.)	Size of conductor (no. of wires/in.)
Unipren				
4	5E/3037	0·105	49·66	19/0·006
6	5E/3038	0·110	30·95	19/0·0076
9	5E/3039	0·115	17·82	33/0·0076
12	5E/3040	0·130	14·66	40/0·0076
18	5E/3041	0·150	8·41	70/0·0076
24	5E/3042	0·170	5·34	110/0·0076
35	5E/3043	0·200	3·23	73/0·012
50	5E/3044	0·255	1·97	120/0·012
70	5E/3045	0·310	1·30	182/0·012
100	5E/3046	0·370	0·802	294/0·012
135	5E/3047	0·445	0·517	203/0·018
150	5E/3048	0·495	0·424	248/0·018
170	5E/3055	0·550	0·325	323/0·018
200	5E/3056	0·610	0·253	416/0·018
230	5E/3057	0·680	0·204	513/0·018
280	5E/3058	0·750	0·158	666/0·018
Uniprenal				
35	5E/3081	0·260	3·279	41/0·020
50	5E/3082	0·325	1·923	70/0·020
70	5E/3083	0·385	1·281	105/0·020
100	5E/3084	0·465	0·804	168/0·020
135	5E/3085	0·570	0·507	266/0·020
150	5E/3086	0·630	0·399	342/0·020
170	5E/3087	0·705	0·327	418/0·020
200	5E/3088	0·775	0·255	532/0·020
Uniprenmet				
4	5E/3089	0·130	49·66	19/0·006
6	5E/3090	0·135	30·95	19/0·0076
9	5E/3091	0·140	17·82	33/0·0076
12	5E/3092	0·170	14·66	40/0·0076
18	5E/3093	0·190	8·41	70/0·0076
24	5E/3094	0·210	5·34	110/0·0076
35	5E/3095	0·240	3·23	73/0·012
50	5E/3096	0·295	1·97	120/0·012
Uniflexpren				
6	5E/3744	0·110	34	48/0·0048

TABLE 2

Range of multi-core Pren cables

Cable	Stores Ref.	Overall dia. (in.) (max.)
Duprensheath		
6	5E/3113	0·175×0·280
Tripren		
4	5E/3073	0·255
6	5E/3074	0·265
9	5E/3075	0·275
12	5E/3076	0·305
18	5E/3077	0·350
24	5E/3078	0·395
Triprenmet		
4	5E/3105	0·285
6	5E/3106	0·295
9	5E/3107	0·305
12	5E/3108	0·335
18	5E/3109	0·380
24	5E/3110	0·425
Triprensheath		
6	5E/3114	0·295
Quinpren		
6	5E/3079	0·325
Quinprenmet		
6	5E/3111	0·355
Quinprensheath		
6	5E/3115	0·355
Septopren		
6	5E/3080	0·355
Septoprenmet		
6	5E/3112	0·385
Septoprensheath		
6	5E/3116	0·385

Flexpren

8. These cables, of which only a single-core version is available, are similar to Unipren cables except that the conductor is of a braided construction on a string centre.

Current rating identification

9. All single-core cables with copper conductors up to and including 12 amp. have the polychloroprene coloured to indicate the nominal current rating; i.e., 4 amp. red, 6 amp. blue, 9 amp. brown, and 12 amp. yellow; Uniflexpren 6 is coloured black. This coding is also employed for multi-core cables, in which the outer glass braid or polychloroprene sheath is coloured; individual cores are coloured as described in para. 10. Cables of 18 amp. and above, and single-core cables with aluminium conductors, are coloured blue and yellow respectively, and have the current rating printed in black at intervals along the cable.

Core identification

10. In multi-core Pren cables, the polychloroprene covering of each core is coloured for core identification; the colour coding employed is shown in Table 3.

TABLE 3

Colour coding for core identification

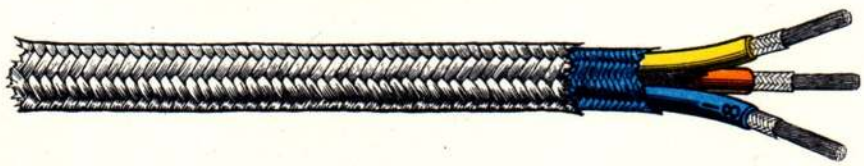
No. of cores	Colour of polychloroprene
2	Red and blue
3	Red, blue and yellow
5	Red, blue, yellow, green and white
7	Red, blue, yellow, green, white, black and brown

UNIPREN 6

UNIPRENAL 200

UNIFLEXPREN 6

TRIPRENMET 18



QUINPRENSHEATH 6

Fig.1 Typical Pren cables