Chapter 3

MISCELLANEOUS LOW-TENSION CABLES

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LIST OF ILLUSTRATIONS

Introduction

1. This chapter describes various early types of low-tension cables. Other cables which have been developed for special applications are described in separate chapters in this section and general information on the installation and servicing of cables will be found in A.P.4343, Vol. 1, Sect. 12.

DESCRIPTION

2. The name under which a cable is listed is based on the make-up, covering and function of the cable. Each name is thus directly descriptive of the core, covering, rating and special purpose of the cable concerned, so that the correct type of cable for any specific purpose may be easily selected.

(1) *Core.*—The prefix of a cable name generally indicates the number of cores of which it is made up. Thus cables, the names of which begin with uni-, du-, or tri-, will have one, two or three cores respectively.

(2) *Cover.*—The type of covering which binds the cores together is shown by the main part of the class name. For example, "cel" indicates a cable finished in cellulose varnish. "Met" in the cable name indicates that the outer cover of the cable is braided with metal wire.

(3) *Rating.*—A numeral following the cable name generally classifies the normal current rating of the cable, based on voltage drop and temperature rise (*para.* 6).

Thus "Ducel 4" is a two-core cable, finished in cellulose lacquer and nominally classified at 4 amperes. "Trimet 7" describes a three-core cable, finished in metal braiding and nominally classified at 7 amperes.

Cores

3. Each core of a cable is made up of a number of strands of copper wire, and on the gauge of these strands and the number used will depend the current carrying capacity of the core. For example, Unimet 4 is a one-core cable, the core being usually composed of 9 strands of 0·012 gauge wire, with a current carrying capacity of 4 amperes, whilst Unimet 64, still a one-core cable, has 368 strands of 0·012 gauge wire, and a current carrying capacity of 64 amperes.

4. The following prefixes are used to indicate core numbers in the general ranges of aircraft low tension cables:—

Uni-	Meaning	1 core
Du-		2
Tri-		3
Quadra-		4
Quin- or quinto-		5
Sexto-		6
Septo-		7
Octo-		8
Nono-(obsolescent)		9
Deca- or Tencore-		10
Twelve-		12
Twentwo-		22
Twenfive-		25

(A.L.51, Dec. 55)

Covering

5. The following list gives the class names of the various types of cable used in aircraft and associated ground equipment for all purposes except high-tension and radio frequency, together with a brief description of the covering indicated by each name. Unless otherwise stated, the conductor cores for these low tension cables are of tinned stranded copper, insulated with VIR—Vulcanised India Rubber or an equivalent synthetic substitute. Details of H.T. cables will be found in Chap. 6 of this section.

Aircraft wiring

(1) -cel- Cores insulated with VIR, taped and cotton braided, with a cellulose finish overall, as in Ducel 4 (*fig.* 1).

(2) -rubber- Cores insulated with VIR; no further covering, as in Unirubber 7 (*fig.* 1). "Unirubbersmall" cables are used for radio cable-forms only.

(3) -vin- Cores insulated with VIR, and protected by an overall sheath of PVC (Polyvinylchloride), as in Trivin 7 (*fig.* 1). The VIN range of cables is intended to supersede the CEL range, when adequate supplies are available.

(4) -met- Cores insulated with VIR, taped and braided overall with tinned copper wire, as in Sextomet 4 (*fig.* 1). The flexmet range is similar in covering, but has a more flexible conductor, as Uniflexmet (*fig.* 1).

Special purpose cables

(5) -sheath small- Cores insulated with VIR and protected by T.R.S. (tough rubber sheath). For use on armament requiring very flexible cable at extremely low temperatures. Quinto-sheath small 4 (*fig.* 1) illustrates this type.

(6) -flamet- The VIR insulated cores have a glass silk covering, they are then taped and braided overall with tinned copper wire. This class, of which Duflamet 7 (*fig.* 1) is an example, is designed for use in positions where fire-resisting qualities are a requirement.

(7) -flex- The cores are insulated with VIR and then cotton braided. This class of cable is used for special purpose low rating wiring only, as in Instruflex, for electrical instrument wiring.

(8) -flexrubber- The cores are insulated with VIR; no further covering. This cable is similar to (2) but with extra-flexible conductors. It is used for electrically heated clothing.

(9) -genmet- The VIR insulated cores are taped and braided with tinned copper wire overall. This cable is designed for connecting engine-driven aircraft generators to the general installation. Trigenmet (*fig.* **1**) is typical of this range.

(10) -coremet- Cores insulated with VIR, taped, and braided overall with tinned copper wire, as in Sextocoremet No. 1. Sometimes individual cores also are braided with tinned copper wire, as in Octocoremet No. 2.

(11) -corevinmet- Cores insulated with rubber and/or polythene, are sheathed with PVC and metal braided overall. For connecting Type WW, sockets used for interconnecting radio equipment.

(12) -petrol resisting- The conductor is insulated with a petrol resisting material. The cores are wormed to circular form, and sheathed with a petrol resisting material. This cable, as its name implies, is designed for use with petrol gauges. 3-core petrol resisting cable (*fig.* 1) is typical of this range.

(13) -univinstwire- A single core cable, the stranded copper conductor being sheathed in a thin wall of PVC in one of eleven different colours. Designed for use with instruments where space restriction prevents the use of a larger sized wire. Univinstwire Red is shown in fig. 1.

(14) -stretch- Elastic core covered with metal wire braiding, interlaced with rayon to form the conductor rubber-sheathed overall. An extensive intercommunication cable.

Cables for ground use

(15) -TRS- (sheath). Tough rubber sheathed cables for trailing across open ground only. Several class names come under this head, including Dusheath, Trisheath, Quadrasheath and Quintosheath.

(16) -allvin- The stranded copper conductors are PVC (Vin) insulated and sheathed. These cables are introduced as substitutes for the rubber cables in the TRS group, to relieve the rubber shortage. It should be noted that while Duvin, used for aircraft installation, is flat, Duallvin, used for ground training purposes, is round. Duallvin (*fig.* 1) is a typical example.

(17) -vircom- The VIR insulated cores are taped, cotton braided, and compounded. This type of cable is intended for fixed wiring on ground equipment and buildings.

(18) -Lead sheathed cables- The VIR insulated cores are taped and lead sheathed

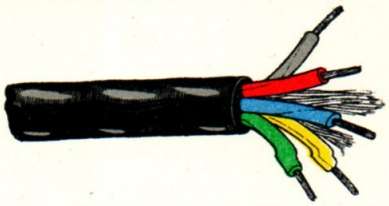
overall. This group is intended for fixed wiring under outdoor ground conditions. In this range are Unilead and Twinflat; fig. 1 shows Twinflat.

Current rating

6. The numeral at the end of the cable name usually indicates the nominal classified current rating, based on temperature rise and voltage drop. As a general approximation, it may be said that the current rating of the small sizes up to and including the 19 size is based on a permissible voltage drop of 0·1 volt per yard. The 37 size gives a drop of 0·1 volt in 1·5 yards and the 64 size a drop of 0·1 volt in 2·5 yards. For greater accuracy, the following table gives the normal and maximum possible continuous current for cables installed each by itself in free space. The maximum figures are based on temperature rise in air of about 20 deg. C. Allowances must be made when cables are bunched or enclosed in conduit, and the voltage drop must be taken into account.

NORMAL continuous rating (amp.)	Volt drop per yd.	MAXIMUM continuous rating (amp.) varying with the number of cores forming the cable							
		1 core	2 core	3 core	4 core	5 core	6 core	7 core	Over 7
4	·100	10	10	10	6	6	6	6	4
7	·100	12·5	12·5	12·5	9	9	9	9	7
19	·100	30	25	22	19	19	19	19	19
37	·062	60	50						
64	·039	106	95						
83	·034	144							
138	·034	206							

QUINTOSHEATH SMALL 4

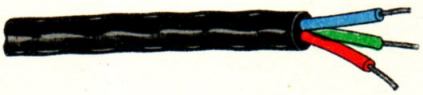


DUALLVIN

DUCEL 4

TWINFLAT

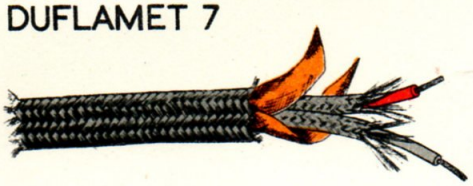
PETROL-RESISTING 3-CORE



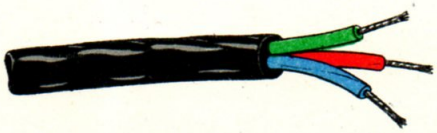
UNIFLEXMET

UNIRUBBER 7

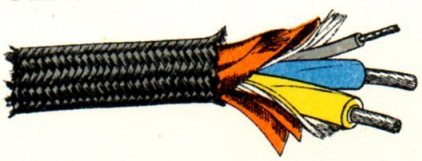
DUFLAMET 7



TRIVIN 7



TRIGENMET



UNIVINSTWIRE RED 1

SEXTOMET 4

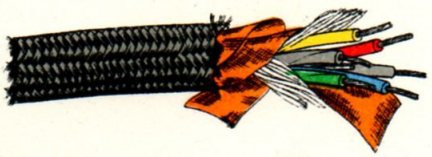


Fig.1 Types of low-tension cable

PP7846 572584 7579 1 56 2125 C & P Gp. 959 (4)