

Chapter 16 THERMOCOUPLE CABLES

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Introduction

1. The cables described in this chapter are all twin-core, with positive and negative conductors of different materials. They are used either in the manufacture of thermocouples, or as compensating or extension leads in associated circuits, and differ in such details as operating temperature, and thermo-electric accuracy as required by their particular function.

DESCRIPTION

Ducunivin

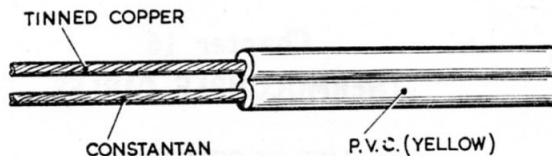
2. The range of Ducunivin cables is given in Table 1, which gives details of construction. These cables are used either for compensating leads for operation at ambient temperatures up to 70 deg. C, or in the manufacture of thermocouples. No Section 5E Stores Ref. numbers are quoted, since Ducunivin when used for compensating leads

TABLE 1
Range of Ducunivin cables

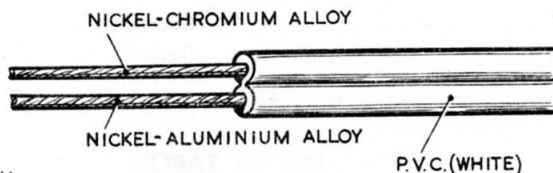
| Cable | Stores Ref. | Overall dimensions of cable (in.) (max.) | Resistance of conductors (go and return) measured on complete cable at 20 deg. C (ohms per 100 yds.) | Size of conductor (No. of wires/in.) |
|-----------|-------------|--|--|--------------------------------------|
| Ducunivin | | | +1½ per cent. (all -6 per cent.) | |
| AJ | * | 0.164 × 0.318 | 52.5 | 12/0.012 |
| AK | * | 0.187 × 0.364 | 26.25 | 25/0.012 |
| AL | * | 0.199 × 0.388 | 17.5 | 37/0.012 |
| AM | * | 0.215 × 0.420 | 13.13 | 50/0.012 |
| AN | * | 0.223 × 0.436 | 10.5 | 62/0.012 |
| AO | * | 0.236 × 0.462 | 8.75 | 74/0.012 |
| AP | * | 0.241 × 0.472 | 7.5 | 87/0.012 |
| AQ | * | 0.249 × 0.488 | 6.56 | 99/0.012 |
| AR | * | 0.259 × 0.508 | 5.83 | 111/0.012 |
| AS | * | 0.270 × 0.530 | 5.25 | 124/0.012 |
| AT | * | 0.307 × 0.604 | 4.37 | 1 × 9/(0.012 +18 × 8) |

* Not provisioned as cable.

DUCUNIVIN



DUCRALVIN



DUCRALSIL

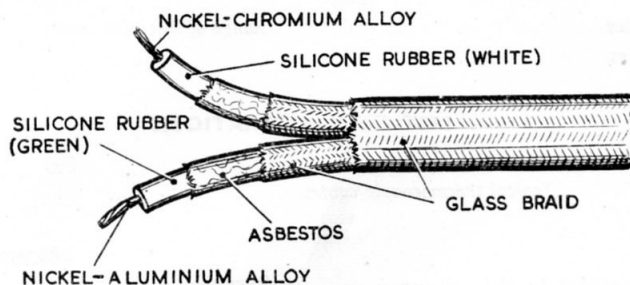


Fig. 1. Typical thermocouple cables

is not provisioned as cable, but as complete leads; cables which have passed more stringent thermo-electric tests have a suffix (T) after the cable type, e.g. Ducunivin AJ (T), and are used in the manufacture of thermocouples.

3. Each cable has two conductors, a positive

conductor consisting of stranded or bunched tinned annealed copper wires, and a negative conductor consisting of stranded or bunched annealed constantan wires. A layer of yellow P.V.C. is then extruded over both conductors simultaneously to form a twin cable of figure-of-eight cross-section.

TABLE 2
Range of Ducralvin cables

| Cable | Stores Ref. | Overall dimensions of cable (in.) (max.) | Resistance of conductors (go and return) measured on complete cable at 20 deg. C (ohms per 100 yds.) | Size of conductor (No. of wires/in.) |
|-----------|-------------|--|--|--------------------------------------|
| Ducralvin | | | +2 per cent. (all-6 per cent.) | |
| BJ | * | 0.197 x 0.384 | 36.73 | 35/0.012 |
| BK | * | 0.215 x 0.420 | 25.71 | 50/0.012 |
| BL | * | 0.253 x 0.496 | 12.86 | 99/0.012 |
| No. 1 | 5E/3705 | 0.168 x 0.326 | 84.00 | 15/0.012 |
| No. 2 | 5E/3706 | 0.192 x 0.374 | 42.00 | 31/0.012 |
| No. 3 | 5E/3707 | 0.223 x 0.436 | 21.00 | 61/0.012 |
| No. 4 | 5E/3708 | 0.247 x 0.484 | 14.00 | 91/0.012 |

* Not provisioned as cable.

RESTRICTED

Ducralvin

4. Ducralvin cables are used as extension leads, and are suitable for continuous operation at ambient temperatures up to 70 deg. C. They are in two categories, as indicated in Table 2, those provisioned as cable under Section 5E Stores Ref. numbers and those provisioned only as complete leads.

5. Each cable has two conductors, a positive conductor of stranded or bunched, bright nickel-chromium alloy wires, and a negative conductor of stranded or bunched, bright nickel-aluminium alloy wires. A layer of white P.V.C. is then extruded over both conductors simultaneously to form a twin cable of figure-of-eight cross-section.

Ducralsil

6. Ducralsil cables are also used as extension leads, and are suitable for continuous

operation in ambient temperatures between 70 deg. C. and 150 deg. C, and between -20 deg. C. and -75 deg. C. where flexibility is required. They are in two categories, those provisioned as cable under Section 5E and those provisioned only as complete leads.

7. Each cable has two conductors, a positive conductor consisting of rope stranded or bunched, bright nickel-chromium alloy wires, and a negative conductor of rope stranded or bunched, bright nickel-aluminium alloy wires. Each core has insulation of silicone rubber, coloured white for the positive, conductor and green for the negative conductor, over which are protective layers of asbestos and glass braid, each impregnated with silicone varnish. The two cores are then laid parallel to form a flat twin cable, braided overall with glass and impregnated with silicone varnish.

TABLE 3
Range of Ducralsil cables

| Cable | Stores Ref. | Overall dimensions of cable (in.) (max.) | Resistance of conductors (go and return) measured on complete cable at 20 deg. C (ohms per 100yds.) | Size of conductor (No. of wires/in.) |
|-----------|-------------|--|---|--------------------------------------|
| Ducralsil | | | +2 per cent. (all—6 per cent.) | |
| BJ | * | 0.449 × 0.238 | 36.73 | 35/0.012 |
| BK | * | 0.501 × 0.264 | 25.71 | 49/0.012 |
| BL | * | 0.619 × 0.323 | 12.86 | 97/0.012 |
| No. 1 | 5E/3709 | 0.367 × 0.197 | 84.00 | 15/0.012 |
| No. 2 | 5E/3710 | 0.433 × 0.230 | 42.00 | 30/0.012 |
| No. 3 | 5E/3711 | 0.525 × 0.275 | 21.00 | 58/0.012 |
| No. 4 | 5E/3712 | 0.599 × 0.313 | 14.00 | 89/0.012 |

* Not provisioned as cable.

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