PARAMOUNT
WIRES & CABLES

# LT AERIAL BUNCH CABLES

Cross sectional view of
Aerial Bunch Cables


1.1 KV Volt Grade, are used for distributing power to individual consumers by utility service providers such as electricity boards and electricity distributing authorities. The cables are suspended overhead using electrical poles. The cables can be tapped intermittently from any required position, enabling them to be used in urban as well as rural areas.

### Configuration
Single Phase or Three Phase systems with or without Street Light line.

### Conductor
Phase or lighting conductor: Electrical grade Aluminium of H2 or H4 grade as per IS: 8130
Messenger conductor: Aluminium Silica and Magnesium Alloy.

### Insulation
XLPE with Sioplas Technique.

### Identification of Phase
Ridges provided on the insulation of Phase Conductors: 1 ridge for the 1st phase, 2 ridges for the 2nd phase and 3 ridges for the 3rd phase. The Neutral phase may have 4 ridges if required.

### Colour of Insulation
As the cable remains exposed to environmental elements such as UV rays from sunlight, the insulation is mixed with a small amount of carbon black to prevent the deterioration of polythene.

### Construction of Cable
The phase conductor can be of single phase or three phases. A lighting conductor can be also incorporated for street lighting. A messenger conductor supports the weight of the cable and keeps the assembly strung under tension. Phase conductors are made of concentrically stranded Aluminium Wires having 7 or 19 wires. Messenger conductors are made of a specially treated Silica, Magnesium and Aluminium Alloy having 7 or 19 wires. Phase and lighting conductors may be insulated with XLPE compound of Sioplas Technology. Messenger conductors are kept either bare or insulated. Phase and lighting conductors are sometimes twisted around the messenger conductor. In special cases a neutral conductor may also be provided separately. Generally, the messenger acts as earth and neutral.

### This construction has additional advantages
Cables are lighter in weight
Easy to install
Can be installed on poles, on walls etc.
Easy to make terminations and branch off joints on live wire as well
Protection against power theft

## Twisting and Laying

The phase conductors are being allowed to slide freely over the messenger conductor during temperature fluctuation. It is also to be ensured that during sliding the insulation should not get scratches due to rubbing effect. During expansion and contraction, the phase conductors try to move toward the ends exerting additional stress at the terminating point or at the clipping point. By special twisting process such forces are neutralised. During installation and branching off, phases conductors can easily be loosened to crimp to the connectors without straining and damaging the phase conductor.

### Paramount Aerial Bunched Cable : 1.1KV grade Stranded & Compacted Aluminium Phase Conductor, and Stranded Messenger Conductor with All Aluminium Alloy, Phase Conductor is insulated with XLPE (Sioplas) Compound, Messenger is either insulated or bare. Referred specification IS:14255-1995 up to the latest amendment.

| Sl. No. | Description and Type of Cable | Number of Wires | | Thickness of XLPE Insulation | | Approx overall Diameter | Approx Weight of Cable | Breaking Load of Messenger | Maximum D.C Resistance Ohms / Km | | AC Current Rating Amps |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase | Messenger | Phase | Messenger | | | | Phase | Messenger | |
| | | | | mm | mm | mm | Kg/KM | KN (min) | | | In air at 40°C |
| | **With insulated messenger conductor** | | | | | | | | | | |
| 1 | 1 C x 16 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 20.0 | 165 | 7.0 | 1.910 | 1.380 | 72 |
| 2 | 3 C x 16 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 22.0 | 301 | 7.0 | 1.910 | 1.380 | 64 |
| 3 | 1 C x 25 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 22.4 | 195 | 7.0 | 1.200 | 1.380 | 99 |
| 4 | 3 C x 25 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 25.0 | 390 | 7.0 | 1.200 | 1.380 | 84 |
| 5 | 1 C x 35 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 27.3 | 227 | 7.0 | 0.868 | 1.380 | 120 |
| 6 | 3 C x 35 mm² + 25 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 27.4 | 486 | 7.0 | 0.868 | 1.380 | 105 |
| 7 | 1 C x 35 mm² + 35 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 28.0 | 259 | 10.1 | 0.868 | 0.986 | 120 |
| 8 | 3 C x 35 mm² + 35 mm² (insulated) | 7 | 7 | 1.20 | 1.20 | 28.4 | 518 | 10.1 | 0.868 | 0.986 | 105 |
| 9 | 1 C x 50 mm² + 35 mm² (insulated) | 7 | 7 | 1.50 | 1.20 | 29.0 | 317 | 10.1 | 0.641 | 0.986 | 150 |
| 10 | 3 C x 50 mm² + 35 mm² (insulated) | 7 | 7 | 1.50 | 1.20 | 32.3 | 692 | 10.1 | 0.641 | 0.986 | 130 |
| 11 | 3 C x 70 mm² + 50 mm² (insulated) | 7 | 7 | 1.50 | 1.50 | 37.5 | 939 | 14.0 | 0.443 | 0.689 | 155 |
| 12 | 3 C x 70 mm² + 70 mm² (insulated) | 7 | 7 | 1.50 | 1.50 | 39.0 | 1002 | 19.7 | 0.443 | 0.492 | 155 |
| 13 | 3 C x 95 mm² + 70 mm² (insulated) | 19 | 7 | 1.50 | 1.50 | 42.7 | 1237 | 19.7 | 0.32 | 0.492 | 190 |
| 14 | 3 C x 120 mm² + 70 mm² (insulated) | 19 | 7 | 1.60 | 1.50 | 46.0 | 1482 | 19.7 | 0.253 | 0.492 | 220 |
| 15 | 3 C x 150 mm² + 70 mm² (insulated) | 19 | 7 | 1.80 | 1.50 | 50.0 | 1791 | 19.7 | 0.206 | 0.492 | 250 |
| | | | | | | | | | | | |
| | **With bare messenger conductor** | | | | | | | | | | |
| 1 | 1 C x 16 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | N.A* | 18.5 | 137 | 7.0 | 1.910 | 1.380 | 72 |
| 2 | 3 C x 16 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | -do- | 19.3 | 272 | 7.0 | 1.910 | 1.380 | 64 |
| 3 | 1 C x 25 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | -do- | 19.5 | 167 | 7.0 | 1.200 | 1.380 | 99 |
| 4 | 3 C x 25 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | -do- | 20.5 | 362 | 7.0 | 1.200 | 1.380 | 84 |
| 5 | 1 C x 35 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | -do- | 22.0 | 199 | 7.0 | 0.868 | 1.380 | 120 |
| 6 | 3 C x 35 mm² + 25 mm² (bare) | 7 | 7 | 1.20 | -do- | 23.5 | 458 | 7.0 | 0.868 | 1.380 | 105 |
| 7 | 1 C x 35 mm² + 35 mm² (bare) | 7 | 7 | 1.20 | -do- | 24.6 | 226 | 10.1 | 0.868 | 0.986 | 120 |
| 8 | 3 C x 35 mm² + 35 mm² (bare) | 7 | 7 | 1.20 | -do- | 25.0 | 485 | 10.1 | 0.868 | 0.986 | 105 |
| 9 | 1 C x 50 mm² + 35 mm² (bare) | 7 | 7 | 1.50 | -do- | 26.6 | 284 | 10.1 | 0.641 | 0.986 | 150 |
| 10 | 3 C x 50 mm² + 35 mm² (bare) | 7 | 7 | 1.50 | -do- | 26.8 | 659 | 10.1 | 0.641 | 0.986 | 130 |
| 11 | 3 C x 70 mm² + 50 mm² (bare) | 7 | 7 | 1.50 | -do- | 31.2 | 890 | 14.0 | 0.443 | 0.689 | 155 |
| 12 | 3 C x 70 mm² + 70 mm² (bare) | 7 | 7 | 1.50 | -do- | 34.4 | 946 | 19.7 | 0.443 | 0.492 | 155 |
| 13 | 3 C x 95 mm² + 70 mm² (bare) | 19 | 7 | 1.50 | -do- | 36.0 | 1179 | 19.7 | 0.32 | 0.492 | 190 |
| 14 | 3 C x 120 mm² + 70 mm² (bare) | 19 | 7 | 1.60 | -do- | 38.0 | 1425 | 19.7 | 0.253 | 0.492 | 220 |
| 15 | 3 C x 150 mm² + 70 mm² (bare) | 19 | 7 | 1.80 | -do- | 40.0 | 1735 | 19.7 | 0.206 | 0.492 | 250 |

## Paramount Aerial Bunched Cable :1.1KV grade Stranded & Compacted Aluminium Phase Conductor, and Stranded Messenger Conductor with All Aluminium Alloy, Phase Conductor is insulated with XLPE (Sioplas) Compound, Messenger is either insulated or bare with lighting Conductor of 16 mm². Referred Specification IS:14255 - 1995 upto the latest amendment.

| Sl. No. | Description and Type of Cable | Number of Wires | | Thickness of XLPE Insulation | | Approx overall Diameter | Approx Weight of Cable | Breaking Load of Messenger | Maximum D.C Resistance Ohms / Km | | AC Current Rating Amps |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phase | Messenger | Phase | Messenger | | | | Phase | Messenger | |
| | | | | mm | mm | mm | Kg/KM | KN (min) | | | In air at 40°C |
| | **With insulated messenger conductor** | | | | | | | | | | |
| 1 | 3 C x 16 mm² + 25 mm² (insulated)+16 mm² | 7 | 7 | 1.20 | 1.20 | 23.5 | 369 | 7.0 | 1.910 | 1.380 | 62 |
| 2 | 3 C x 25 mm² + 25 mm² (insulated)+16 mm² | 7 | 7 | 1.20 | 1.20 | 25.0 | 457 | 7.0 | 1.200 | 1.380 | 82 |
| 3 | 3 C x 35 mm² + 25 mm² (insulated)+16 mm² | 7 | 7 | 1.20 | 1.20 | 27.5 | 554 | 7.0 | 0.868 | 1.380 | 103 |
| 4 | 3 C x 35 mm² + 35 mm² (insulated)+16 mm² | 7 | 7 | 1.20 | 1.20 | 28.4 | 586 | 10.1 | 0.868 | 0.986 | 103 |
| 5 | 3 C x 50 mm² + 35 mm² (insulated)+16 mm² | 7 | 7 | 1.50 | 1.20 | 32.5 | 760 | 10.1 | 0.641 | 0.986 | 127 |
| 6 | 3 C x 70 mm² + 50 mm² (insulated)+16 mm² | 7 | 7 | 1.50 | 1.50 | 37.5 | 1007 | 14.0 | 0.443 | 0.689 | 154 |
| 7 | 3 C x 70 mm² + 70 mm² (insulated)+16 mm² | 7 | 7 | 1.50 | 1.50 | 39.5 | 1070 | 19.7 | 0.443 | 0.492 | 154 |
| 8 | 3 C x 95 mm² + 70 mm² (insulated)+16 mm² | 19 | 7 | 1.50 | 1.50 | 42.5 | 1304 | 19.7 | 0.320 | 0.492 | 188 |
| 9 | 3 C x 120 mm² + 70 mm² (insulated)+16 mm² | 19 | 7 | 1.60 | 1.50 | 46.8 | 1550 | 19.7 | 0.253 | 0.492 | 218 |
| 10 | 3 C x 150 mm² + 70 mm² (insulated)+16 mm² | 19 | 7 | 1.80 | 1.50 | 50.8 | 1860 | 19.7 | 0.206 | 0.492 | 248 |
| | | | | | | | | | | | |
| | **With bare messenger conductor** | | | | | | | | | | |
| 1 | 3 C x 16 mm² + 25 mm² (bare)+16 mm² | 7 | 7 | 1.20 | N.A* | 19.5 | 340 | 7.0 | 1.910 | 1.380 | 62 |
| 2 | 3 C x 25 mm² + 25 mm² (bare)+16 mm² | 7 | 7 | 1.20 | -do- | 20.5 | 429 | 7.0 | 1.200 | 1.380 | 82 |
| 3 | 3 C x 35 mm² + 25 mm² (bare)+16 mm² | 7 | 7 | 1.20 | -do- | 23.5 | 526 | 7.0 | 0.868 | 1.380 | 103 |
| 4 | 3 C x 35 mm² + 35 mm² (bare)+16 mm² | 7 | 7 | 1.20 | -do- | 25.0 | 553 | 10.1 | 0.868 | 0.986 | 103 |
| 5 | 3 C x 50 mm² + 35 mm² (bare)+16 mm² | 7 | 7 | 1.50 | -do- | 26.8 | 727 | 10.1 | 0.641 | 0.986 | 127 |
| 6 | 3 C x 70 mm² + 50 mm² (bare)+16 mm² | 7 | 7 | 1.50 | -do- | 31.5 | 958 | 14.0 | 0.443 | 0.689 | 154 |
| 7 | 3 C x 70 mm² + 70 mm² (bare)+16 mm² | 7 | 7 | 1.50 | -do- | 34.5 | 1013 | 19.7 | 0.443 | 0.492 | 154 |
| 8 | 3 C x 95 mm² + 70 mm² (bare)+16 mm² | 19 | 7 | 1.50 | -do- | 37.0 | 1248 | 19.7 | 0.320 | 0.492 | 188 |
| 9 | 3 C x 120 mm² + 70 mm² (bare)+16 mm² | 19 | 7 | 1.60 | -do- | 39.0 | 1493 | 19.7 | 0.253 | 0.492 | 218 |
| 10 | 3 C x 150 mm² + 70 mm² (bare)+16 mm² | 19 | 7 | 1.80 | -do- | 40.0 | 1803 | 19.7 | 0.206 | 0.492 | 248 |

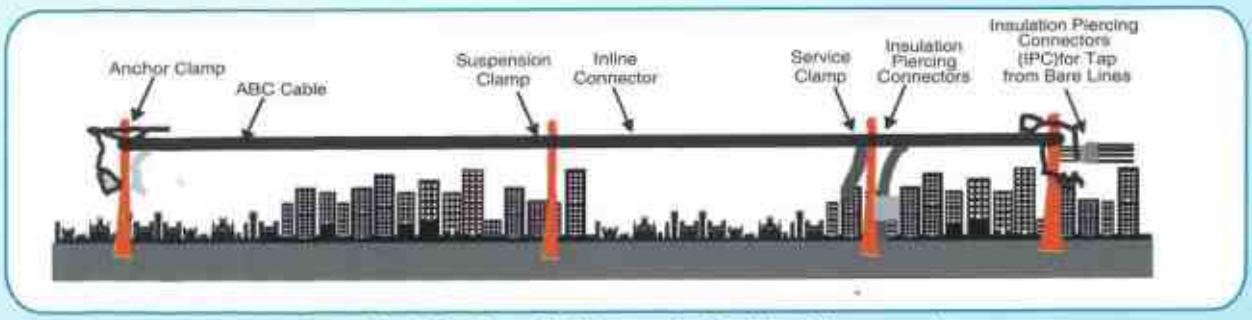
Note : Insulation thickness of 16 mm² for lighting conductor — 1.20 mm
Current rating of 16 mm² lighting conductor — 62 Amps.
Conductor operating temperature — 90°C
Short circuit temperature for one sec. — 250°C

**Ambient Air temperature is 40°C**

**Rating factor for variation in air temperature :**

| Air Temperature °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|
| Rating Factor | 1.32 | 1.25 | 1.16 | 1.09 | 1 | 0.9 | 0.81 |

* Not Applicable




**Typical LT Aerial Bunch Cable Network**

# HT AERIAL BUNCH CABLES


11 KV & 33 KV Aerial Bunched cables are used for power distribution in cities where ground space is constrained.

**Configuration**

Size ranges from 35 Sqmm to 400 Sqmm
Three phase cables constitute of three single core screened cables
These phase cable twist around an aluminium alloy messenger conductor enabling it to carry the full load of the cable when mounted on poles
The size of the messenger conductor is designed based on the weight of the cable over a span of poles.

**Conductor**

Stranded aluminium conductor

**Screening**

Screened by an extruded semi conducting layer - XLPE Insulated.
Screened again by an extruded semi conducting layer and a copper tape.

**Insulation**

XLPE

**Phase Identification**

Coloured polyester strip Red, Yellow and Blue, under copper tape
Ridges 1, 2 and 3.

**Outer Sheath**

Overall sheathed with PVC/ Polyethylene.

## QUALITY AND TESTING

At Paramount Cables in house testing of raw materials & testing during processing at every stage is a must. There is no lapse allowed at any point where constant improvement is monitored from the beginning to the last stage. Though the construction of LT and HT Aerial Bunch Cables appease quite simple, the manufacturing technique should be such that the cable can accept and withstand all the severe operational hazards for all the times under any circumstances.
Paramount Cables, understanding the inherent intricate operational significance of Aerial Bunch Cables, have oriented themselves to manufacture these cables for the power distribution system particularly for the varied Indian conditions.

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