



# Tirupati Plastomatics Pvt. Ltd.

Quality you can trust...



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Brand Name:  
**Gemini Cables**

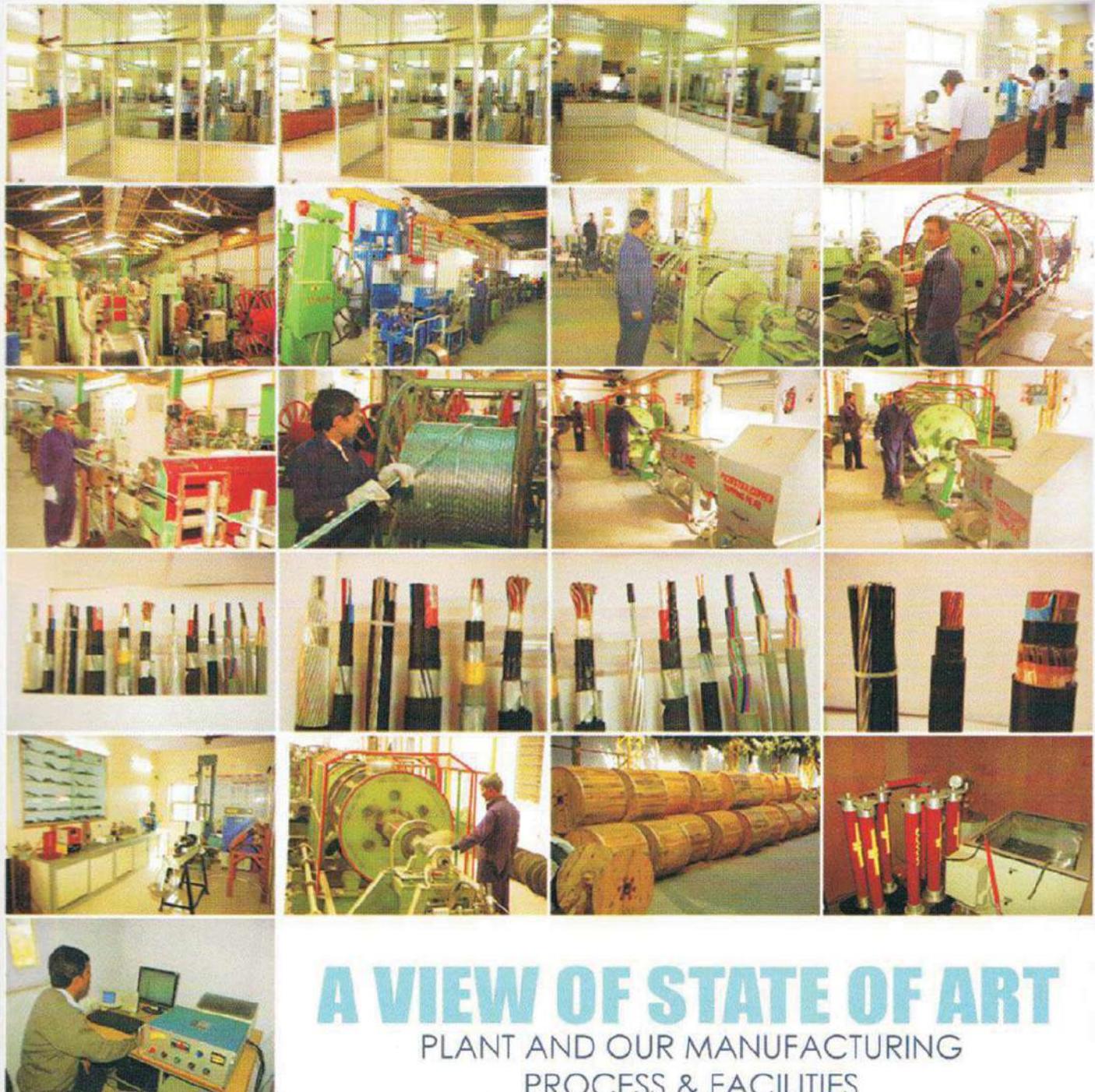


ISO 9001:2008

ISO 14001:2004

OHSAS 18001:2007

# PHOTOGRAPHS



**A VIEW OF STATE OF ART**  
PLANT AND OUR MANUFACTURING  
PROCESS & FACILITIES



**Tirupati Plastomatics Pvt. Ltd.**

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Tirupati Plastomatics Pvt. Ltd.

## About

Tirupati Plastomatics Pvt. Ltd. A flagship company of Gemini Group of industries Jaipur India. The founder of the company Mr. R. S. Gemini who is the managing director & a well-known industrialist & a renowned social worker. Tirupati Plastomatics enjoys the status of an ISO-9001:2008, 150 14001:2004, 01-15AS-18001, BIS, SMEC Australia, Scott Wilson-UK & SABS certified company having a group turnover of Rs. 250.00 crores US\$ 53.76 Million The company is one of the leading manufacturer of all kind of LT PVC/XLPE insulated & sheathed cables, concentric service cable & conductors with own technical know-how for the last 11 years being widely used by Indian railways, utility service providers & private turnkey project executors in electricity distribution, transmission & generation. Tirupati has a dedicated & well-experienced team of techno-commercial experts.

In addition to serving Indian railways & electricity boards, Tirupati has also entered into overseas markets and have executed orders of aerial bunched cables, LV underground cables & AAA conductors, ACSR conductors as per IEC/VDE/DIN/SABS/ASTM/NF/BS specification to EDM, Mozambique, Mazare-E- Sharif power projects in Afghanistan and to South African & UK customers.

## Mission

Guided by the philosophy 'create the best to be followed by the rest', Tirupati Plastomatics aims at building a zero-defect product, which will give value satisfaction to its huge clientele. Tirupati Plastomatics strongly believes that learning and improving is a continuous process for the total growth of the company.

## Vision

Tirupati Plastomatics Pvt. Ltd., the name for dedication, devotion, discipline, discrimination, and determination has made a substantial growth plan with Rupees 1000 Crores turnover projection by 2015.

## Awards & Recognition

- Arch of Excellence Award 2002, All India Organizational Confederation, New Delhi.
- Award from Business Initiative Development Board 2004, New Delhi,
- Indian Achiever Award of Industrial Excellence for the year 2008.



Mr. R.S. Gemini, Managing Director, receiving award presented by Business Initiative Development Organization in the year 2002.



Mr. Salaman Khurshid, Central Minister for External Affairs presenting the 'RASHTRIYA GAURAV AWARD' 2004' to Managing Director of our Company



Mr. Ravi Gemini (Director) receiving "Indian Achiever Award of industrial Excellence" from Dr. Murali Manohar Joshi (Former Union Minister) for year 2008.

## Policy

Grow with customers by providing full customer satisfaction through quality product, support, timely deliveries & new development, operate a safe, healthy & clean environment.

Comply with statutory requirements, all applicable environment, health & safety legislation, prevention of ill health and injury, interests of all stakeholders, prevention of pollution, and continual improvement in the effectiveness and performance of the Integrated Management System by improving process work practices and risk minimization through objective-driven targets.

Integrate quality safety, health & environmental matters in all existing activities and future planning. Create & enhance awareness among employees, society, and other stakeholders about environment protection, minimization of waste, the wise use of energy, water & other natural resources, improve the skill & competence of our employees and contractors so as to enable them to demonstrate their involvement, for sound IMS performance.



Tirupati Plastomatics Pvt. Ltd.





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## INFORMATION

Cenelec Standards published the harmonization documents HD 361 S2 & HD 361 S3 to illustrate the code designation of Harmonized wires and cables. Listed below are some of the most common used and abbreviations for flexible cables.

### 1 - Type of determination

H: Cables and wires to the Harmonized Determination  
A: Approved national type

### 2- Voltage designation U0/U

03: 300/300 Voltage  
05: 300/500 Voltage  
07: 450/750 Voltage

### 3- insulation Material

V: PVC insulation suitable for continuous operating temperature up to 70°C  
V: 2 PVC insulation heat resistance suitable for continuous operating temperature up to 90°C

### 4- Sheathed Material

V: PVC Sheathing suitable for continuous operating temperature up to 70°C  
V:2 PVC Sheathing suitable for continuous operating temperature up to 90°C

### 5- Type of Conductor

K: Flexible Conductor for fixed laying  
F: Flexible Multi - Core

## IDENTIFICATION

### A. Single Core Cables

- Single Phase: Green/Yellow (earth), Blue (Neutral), Brown (Live)
- Three Phase: Green/Yellow (earth), Blue (Neutral), Brown, Black & Grey (Live)

### b. Multi-Core Cables

2 Cores: Blue & Brown



3- Cores: Green/Yellow, Blue & Brown



4- Cores: Green/Yellow, Brown, Black & Grey Or;  
Green/Yellow, Blue, Brown & Black



5- Cores: Green/Yellow, Blue, Brown, Black & Grey





Tirupati Plastomatics Pvt. Ltd.

## SINGLE CORE PVC INSULATED NON-SHEATHED CABLE FOR INTERNAL WIRING 300/500 V

### Technical Specification

Single Core PVC Insulated Non-Sheathed Cable for internal wiring 300/500 V.

### Standard

BS 6004

### Application

BS 6004 Suitable for installation in surface mounted or embodied conduits, only for signaling OR control conduits.

### Conductor

Flexible class 5 copper conductors to BSEN 60228

### Insulation

PVC Type TI 1 to EN 50363-3

### Packing

Coils or Plastic Spools in 100 meters

Other lengths are available upon customer request.



TIRUPATI PLASTOMATICSS PVT. LTD.

### H05V-K

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 70°C MΩ/km	Cable Approximate Weight kg/km
		Min	Max			
0.5	0.6	2.14	2.5	39	0.013	9.5
0.75	0.6	2.2	2.7	26	0.011	12.2
1	0.6	2.4	2.8	19.5	0.010	15.2



Tirupati Plastomatics Pvt. Ltd.

## SINGLE CORE PVC INSULATED NON-SHEATHED HEAT RESISTANCE CABLE FOR INTERNAL WIRING 300/500 V

### Technical Specification

Single Core PVC Insulated Non-Sheathed heat resistance Cable for internal wiring 300/500 V.

### Standard

BS 6004

### Application

Suitable for maximum conductor temperature in normal use 90°C not to be used in contact with objects at temperature higher than 85°C and not suitable for fixed installation in distribution systems.

### Conductor

Flexible class 5 copper conductors to BSEN 60228

### Insulation

PVC Type TI 1 to EN 50363-3

### Packing

Coils or Plastic Spools in 100 meters

Other lengths are available upon customer request.



TIRUPATI PLASTOMATICSS PVT. LTD.

### H05V2-K

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
		Min	Max			
mm <sup>2</sup>	mm	mm	mm	Ω/km	MΩ/km	kg/km

### H05V-K

0.5	0.6	2.1	2.5	39	0.013	9.5
0.75	0.6	2.2	2.7	26	0.011	12.2
1	0.6	2.4	2.8	19.5	0.010	15.2



Tirupati Plastomatics Pvt. Ltd.

## SINGLE CORE PVC INSULATED NON-SHEATHED GENERAL PURPOSE CABLE 450/750 V

### Technical Specification

Single Core PVC Insulated Non-Sheathed General Purpose Cable 450/750 V.

### Standard

BS 6004.

### Application

Suitable for use in channels with cover, Suitable for fixed protected installation in or on light fittings and inside appliances, switch gear and control gear, for voltage up to 1000 V a.c. or up to 750 V to earth d.c.

### Conductor

Flexible class 5 copper conductors to BSEN 60228.

### Insulation

PVC Type TI 1 to EN 50363-3.

### Packing

Coils or Plastic Spools in 100 meters for size up to 16mm<sup>2</sup>  
Size more than 16 mm<sup>2</sup> shall be 500 or 1000 meters packed in wooden drums.  
Other lengths are available upon customer request.



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## H07V-K

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Mean Overall Diameter		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
		Min	Max			

## H05V-K

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Mean Overall Diameter mm	Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km	
1.5	0.7	2.8	3.4	13.3	0.0100	21.5
2.5	0.8	3.4	4.1	7.98	0.0095	35.2
4	0.8	3.9	4.8	4.95	0.0078	49.4
6	0.8	4.4	5.3	3.3	0.0068	68.5
10	1	5.7	6.8	1.91	0.0065	114.6
16	1	6.7	8.1	1.21	0.0053	170.5
25	1.2	8.4	10.2	0.78	0.0050	266
35	1.2	9.7	11.7	0.554	0.0043	378
50	1.4	11.5	13.9	0.386	0.0042	540
70	1.4	13.2	16	0.272	0.0036	745
95	1.6	15.1	18.2	0.206	0.0036	983
120	1.6	16.7	20.2	0.161	0.0032	1242
150	1.8	18.6	22.5	0.129	0.0032	1605
185	2	20.6	24.9	0.106	0.0032	2007
240	2.2	23.5	28.4	0.0801	0.0031	2510



Tirupati Plastomatics Pvt. Ltd.

## PVC INSULATED NON-SHEATHED HEAT RESISTANCE CABLE FOR INTERNAL WIRING 450/750V

### Technical Specification

PVC Insulated Non-Sheathed heat resistance Cable for internal wiring 450/750 V.

### Standard

BS 6004.

### Application

Suitable for maximum conductor temperature in normal use 90°C not to be used in contact with objects at temperature higher than 85°C and not suitable for fixed installation in distribution systems.

### Conductor

Flexible class 5 copper conductors to BSEN 60228

### Insulation

PVC Type TI 3 to EN 50363-3

### Packing

Coils or Plastic Spools in 100 meters for size up to 16mm<sup>2</sup>

Size more than 16 mm<sup>2</sup> shall be 500 or 1000 meters packed in wooden drums.

Other lengths are available upon customer request.



### H05V2-K

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
		Min	Max			
1.5	0.7	2.8	3.4	13.3	0.0100	21.5
2.5	0.8	3.4	4.1	7.98	0.0095	35.2
4	0.8	3.9	4.8	4.95	0.0078	49.4
6	0.8	4.4	5.3	3.3	0.0068	68.5
10	1	5.7	6.8	1.91	0.0065	114.6
16	1	6.7	8.1	1.21	0.0053	170.5
25	1.2	8.4	10.2	0.78	0.0050	266
35	1.2	9.7	11.7	0.554	0.0043	378



Tirupati Plastomatics Pvt. Ltd.

## MULTY-CORE LIGHT DUTY PVC INSULATED AND SHEATHED FLEXIBLE CORE, CIRCULAR TWIN 3-CORE AND 4-CORE, 300/300V

### Technical Specification

Multi-Core Light Duty PVC Insulated and Sheathed flexible cord, circular twin, 3-core and 4-core, 300/300V

### Standard

BS 6500.

### Application

Light duty cable for use in domestic premises, Kitchens and offices and light portable appliances such as radios and table lamps

### Conductor

Flexible class 5 copper conductors to BSEN 60228.

### Insulation

PVC Type TI 2 to EN 50363-3.

### Insulation Colors

2-Core: Blue and Brown

3-Core: Green/Yellow, Brown

4-Core: Green/Yellow, Brown , Black & Gray or  
Green/Yellow, Blue, Brown & Black

### Sheathing

PVC Type TM 2 to EN 50363-4-1

### Standard Sheath Color

White

### Packing

Coils in 100 meters

Other lengths are available upon customer request.



Tirupati Plastomatics Pvt. Ltd.



## H03VV-F

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Radial Thickness of Sheath mm	Mean Overall Diameter		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
			Min	Max			

### Two Cores

0.5	0.5	0.6	4.6	5.9	0.011	37.5
0.75	0.5	0.6	4.9	6.3	0.010	46.3

### Three Cores

0.5	0.5	0.6	4.9	6.3	0.0110	44.5
0.75	0.5	0.6	5.2	6.7	0.0100	55.8

### Four Cores

0.5	0.5	0.6	5.4	6.9	0.0110	54.8
0.75	0.5	0.6	5.7	7.3	0.0100	69.7



**Tirupati Plastomatics Pvt. Ltd.**

## MULTICORE LIGHT DUTY 90°C PVC INSULATED AND SHEATHED FLEXIBLE CORE, CIRCULAR TWIN, 3-CORE AND 4-CORE, 300/300V

### Technical Specification

Multi-Core Light Duty 90°C PVC Insulated and sheathed flexible Cord, Circular twin, 3-core and 4-core, 300/300V

### Standard

BS 6500

### Application

Light duty cable for use in domestic premises, Kitchens and offices and light portable appliances such as radios and table lamps. Suitable for 90°C maximum conductor temperature in normal use.

### Conductor

Flexible class 5 copper conductors to BSEN 60228

### Insulation

2-Core: Blue and Brown

3-Core: Green/Yellow, Blue and Brown

4-Core: Green/Yellow, Brown, Black & gray or green/Yellow, Blue, Brown & Black

### Sheathing

PVC Type TM 3 To EN 50363-4-1

### Standard Sheath Color

White

### Packing

Coils in 100 meters

Other lengths are available upon customer request.



### H03VV-F

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Radial Thickness of Sheath mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
			Min	Max			
<b>Two Cores</b>							
0.5	0.5	0.6	4.6	5.9	5.9	0.011	37.5
0.75	0.5	0.6	4.9	6.3	6.3	0.010	46.3
<b>Three Cores</b>							
0.5	0.5	0.6	4.9	6.3	6.3	0.0110	44.5
0.75	0.5	0.6	5.2	6.7	6.7	0.0100	55.8
<b>Four Cores</b>							
0.5	0.5	0.6	5.4	6.9	6.9	0.0110	54.8
0.75	0.5	0.6	5.7	7.3	7.3	0.0100	69.7



Tirupati Plastomatics Pvt. Ltd.

## MULTY-CORE ORDINARY DUTY PVC INSULATED AND SHEATHED FLEXIBLE CORE, CIRCULAR TWIN 3-CORE, 4-CORE AND 5-CORE 300/500V

### Technical Specification

Multi-Core Ordinary Duty PVC Insulated and Sheathed flexible cord, circular twin, 3-core, 4-core and 5-Core 300/500V

### Standard

BS 6500 for sizes upto 2.5mm<sup>2</sup>. BS 7919 for 4mm<sup>2</sup>

### Application

For use in offices and household appliances such as computers, spin extractors, washing machines, spin dryers and refrigerators and also for all kinds of outdoor industrial use.

### Conductor

Flexible class 5 copper conductors to BSEN 60228.

### Insulation

PVC Type TI 2 to EN 50363-3.

### Insulation Colors

2-Core: Blue and Brown

3-Core: Green/Yellow, Brown

4-Core: Green/Yellow, Brown , Black & Gray or  
Green/Yellow, Blue, Brown & Black

5-Core: Green/Yellow, Brown , Black & Gray

### Sheathing

PVC Type TM 2 to EN 50363-4-1

### Standard Sheath Color

White

### Packing

Coils in 100 meters

Other lengths are available upon customer request.



**Tirupati Plastomatics Pvt. Ltd.**



### H05VV-F

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Radial Thickness of Sheath mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
			Min	Max			
<b>Two Cores</b>							
0.5	0.6	0.8	5.4	6.8	39	0.0130	50.3
0.75	0.6	0.8	5.7	7.2	26	0.0110	57.5
1	0.6	0.8	5.9	7.5	19.5	0.0100	65.5
1.25	0.7	0.8	6.3	8	14.73	0.0100	72.5
1.5	0.7	0.8	6.8	8.6	13.3	0.0100	88.6
2.9	0.8	1	8.4	10.6	7.98	0.0095	140
4.	0.8	1.1	9.7	121	4.95	0.0070	186
<b>Three Cores</b>							
0.75	0.6	0.8	6	7.6	26	0.0110	71
1	0.6	0.8	6.3	8	19.5	0.0100	81
1.25	0.7	0.9	6.9	8.7	14.73	0.0100	103
1.5	0.7	0.9	7.4	9.4	13.3	0.0100	412
2.5	0.8	1	9.2	11.4	7.98	0.0095	172
4	0.8	1.2	10.5	13.1	4.95	0.0070	237
<b>Four Cores</b>							
0.75	0.6	0.8	6.6	8.3	26	0.0110	84
1	0.6	0.9	7.1	9	19.5	0.0100	99
1.5	0.7	1	8.4	10.5	13.3	0.0100	142
2.0	0.8	1.1	10.1	12.5	7.98	0.0095	220
4	0.8	1.2	11.5	14.3	4.95	0.0070	296
<b>Five Cores</b>							
0.75	0.6	0.9	7.4	9.3	26	0.0110	103
1	0.6	0.9	7.8	9.8	19.5	0.0100	123
1.5	0.7	1.1	9.3	11.6	13.3	0.0100	176
2.0	0.8	1.2	11.2	13.6	7.98	0.0095	272
4	0.8	1.4	13.0	16.1	4.95	0.0070	373



Tirupati Plastomatics Pvt. Ltd.

## MULTI-CORE ORDINARY DUTY 90°C PVC INSULATED AND SHEATHED FLEXIBLE CORD, CIRCULAR TWIN, 3-CORE, 4-CORE, AND 5-CORE 300/500V

### Technical Specification

Multi-Core Ordinary Duty 90°C PVC Insulated and Sheathed flexible cord, circular twin, 3-core, 4- core, and 5-core, 300/500 V

### Standard

BS 6500 for sizes upto 2.5mm<sup>2</sup>. BS 7919 for 4mm<sup>2</sup>.

### Application

For use in offices and household appliances such as computers, spin extractors, washing machines, spin dryers and refrigerators and also for all kinds of outdoor industrial use. Suitable for 90°C maximum conductor temperature in normal

### Conductor

Flexible class 5 copper conductors to BSEN 60228.

### Insulation

PVC Type TI 3 to EN 50363-3.

### Insulation Colors

2-Core: Blue and Brown

3-Core: Green/Yellow, Brown

4-Core: Green/Yellow, Brown , Black & Gray or  
Green/Yellow, Blue, Brown & Black

5-Core: Green/Yellow, Brown , Black & Gray

### Sheathing

PVC Type TM 3 to EN 50363-4-1

### Standard Sheath Color

White

### Packing

Coils in 100 meters

Other lengths are available upon customer request.



**Tirupati Plastomatics Pvt. Ltd.**



### H05V2V2-F

Conductor Cross-Sectional area mm <sup>2</sup>	Nominal Radial Thickness of Insulation mm	Radial Thickness of Sheath mm	Mean Overall Diameter mm		Conductor Resistance At 20°C Max. Ω/km	Minimum Insulation Resistance At 90°C MΩ/km	Cable Approximate Weight kg/km
			Min	Max			
<b>Two Cores</b>							
0.5	0.6	0.7	5.4	6.6	39	0.0130	43
0.75	0.6	0.8	5.7	7.2	26	0.0110	57
1	0.6	0.8	5.9	7.5	19.5	0.0100	66
1.5	0.7	0.8	6.8	8.6	13.3	0.0100	89
2.5	0.8	1	8.4	10.6	7.98	0.0095	139
4	0.8	1.1	9.7	12.1	4.95	0.0070	187
<b>Three Cores</b>							
0.5	0.6	0.7	5.5	7	39	0.0130	53
0.75	0.6	0.8	6	7.6	26	0.0110	71
1	0.6	0.8	6.3	8	19.5	0.0100	80
1.5	0.7	0.9	7.4	9.4	13.3	0.0100	112
2.5	0.8	1.1	9.2	11.4	7.98	0.0095	172
4	0.8	1.2	10.5	13.1	4.95	0.0070	236
<b>Four Cores</b>							
0.5	0.6	0.8	6.2	7.9	39	0.0130	68
0.75	0.6	0.8	6.6	8.3	26	0.0110	84
1	0.6	0.9	7.1	9	19.5	0.0100	101
1.5	0.7	1	8.4	10.5	13.3	0.0100	141
2.5	0.8	1.1	10.1	12.5	7.98	0.0095	220
4	0.8	1.2	11.5	14.3	4.95	0.0070	296
<b>Five Cores</b>							
0.75	0.6	0.9	7.4	9.3	26	0.0110	101
1	0.6	0.9	7.8	9.8	19.5	0.0100	120
1.5	0.7	1.1	9.3	11.6	13.3	0.0100	176
2.5	0.8	1.2	11.2	13.9	7.98	0.0095	272
4	0.8	1.4	13	16.1	4.95	0.0070	373



## INDOOR CABLES

### Introduction

Building Wires are used for fixed indoor installations inside conduits and within walls.

Building Wires with multi-cores can be used to connect a power supply to large loads such as air conditioning systems. Example include: copper conductors with PVC insulation (NYA) and copper with PVC insulation and nylon jacketing (THHN).

In this catalogue, we cover all technical aspects of Tirupati Plastomatics wires Indoor Cables. We include design considerations such as type of insulation material, insulation thicknesses, sheath material, and sheath thicknesses. Cables electrical parameters such as conductor DC resistance and current ratings are included as well.

Tirupati Plastomatics wires Indoor Cables are manufactured based on international standards such as IEC 60227, BS 6004, and UL 83. We are also capable of manufacturing according to client requirements and needs.

### Standard

The indoor cables described in this catalogue are all standard types, and their performances have been proved in operation. Construction and tests are in accordance with the recommendation of IEC publications where applicable, indoor cables in accordance to other standards (e.g. BS, VDE, NEMA) can be manufactured upon customer's request.

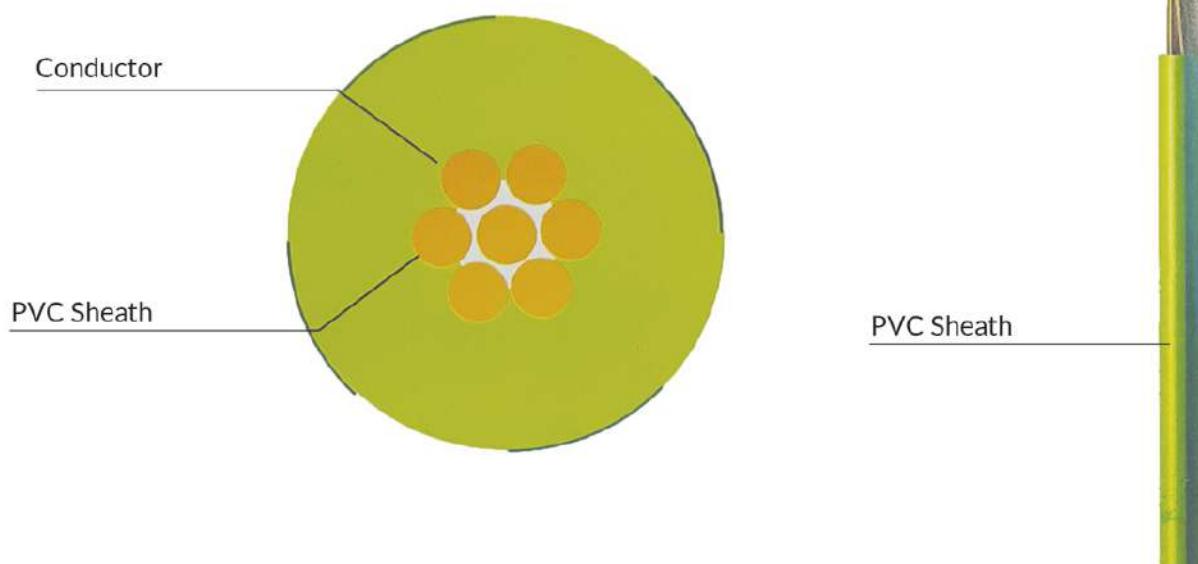
### Variation in Production and Delivery Options

- The provided data is approximate and subject to manufacturing tolerance
- Delivery length tolerance is +/- 5%
- Other product sizes are available upon customer's request

### Jacket Marking

Standard embossed outer jacket marking consisting of:

1. Name of manufacturer
2. Type designation, size of conductor, rated voltage and standard
3. Continuous length marking every meter (if applicable)
4. Year of manufacture





## LAYING INFORMATION

### Minimum Bending Radius During Installation

During laying, the bending radius not be simillar than velus gives below.  
The Radius depends on the outer diameter ( $D_o$ ) of the cable.

#### Cable for Fixed Wiring

Insulation	Conductor	Outer Diameter (mm)	Min. Radius (mm)
PVC of (LSHF)	Copper (Solid Stand or Flexible)	Up to 10 10-25 Above 25	$3D_o$ $4D_o$ $6D_o$

### Electrical Parameters of the Cables

#### DC Resistance of Conductor

The Maximum DC resistance values of conductors at 20°C are as per "IEC 60288" Standard.  
DC resistance per unit length of the conductor at other Conductor temperature  $t$  is given by:

$$R=R_0 [1+\alpha_{20^\circ\text{C}} (t-20^\circ\text{C})]$$

Where :

$R$	=	DC resisteance at temperature $t^\circ\text{C}$ $\Omega/\text{km}$
$R_0$	=	D.C resisteance at temperature 20°C $\Omega/\text{km}$ (given in the relative tables for each type of cable)
$t$	=	
$\alpha_{20^\circ\text{C}}$	=	Conductor temperature $^\circ\text{C}$ Temperature coefficient at 20°C $1/^\circ\text{C}$
For copper conductor $\alpha_{20^\circ\text{C}}$	=	0.00393



**Tirupati Plastomatics Pvt. Ltd.**

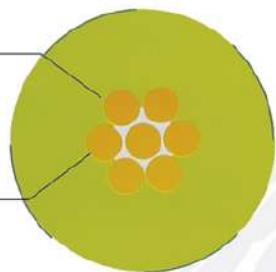
## SINGLE CORE

For indoor fixed installation in dry location

Type	:	CU/PVC
Standard	:	IEC 60227
Nominal Voltage	:	450 / 750 Volt
Conductor	:	Soft annealed solid or standard copper wires
Insulation	:	PVC compound rated 80°C (or LSHF)
Packing	:	Plastic spool-coils or non returnable wood drums as per customer requirement

Conductor

PVC Sheath



Nominal Cross Section mm <sup>2</sup>	Normal Insulation Thickness mm	Approx. Overall Diameter mm	Approx. Cable Weight kg/km	Max DC Resistance at 20°C Ω/km	Current Rating	
					Lead in Conducts A	Lead in Free Air A
<b>Copper Solid Conductors</b>						
1.5	0.7	2.8	21	12.1	21	28
2.5	0.8	3.4	36	7.41	27	38
4	0.8	3.8	47	4.61	34	50
6	0.8	4.3	66	3.08	43	66
10	1.0	5.6	110	1.83	60	89

**Copper Standard Conductors**

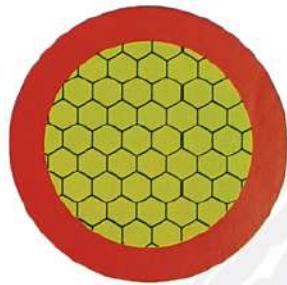
1.5	0.7	3.0	21	12.1	21	28
2.5	0.8	3.6	33	7.41	27	38
4	0.8	4.1	51	4.61	34	50
6	0.8	4.7	72	3.08	43	66
10	1.0	6.0	116	1.83	60	89
16	1.0	7.0	173	1.15	78	115
25	1.2	8.7	270	0.727	103	152
35	1.2	9.8	365	0.524	126	189
50	1.4	11.0	477	0.387	157	235
70	1.4	12.7	660	0.268	196	291
95	1.6	14.7	930	0.193	239	350
120	1.6	16.2	1140	0.153	280	410
150	1.8	18.1	1430	0.124	316	473
185	2.0	20.1	1770	0.0991	364	545
240	2.2	23.0	2330	0.0754	431	650
300	2.4	25.4	2910	0.0601	494	690
400	2.6	29.0	371	0.0470	566	916



## SINGLE CORE

For indoor fixed installation in dry location

Type	:	CU/PVC
Standard	:	IEC 60227
Nominal Voltage	:	350 / 500 & 450 / 750 Volt
Conductor	:	Soft annealed solid or standard copper wires
Insulation	:	PVC compound rated 80°C (or LSHF)
Packing	:	Plastic spool-coils or non returnable wood drums as per customer requirement



### Technical Information

Nominal Cross Section	Normal Insulation Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC Resistance at 20°C	Current Rating	
					Lead in Conducts	Lead in Free Air
mm <sup>2</sup>	mm	mm	kg/km	Ω/km	A	A
0.50	0.6	2.1	9	39.0	8	11
0.75	0.6	2.2	10	26.0	11	17
1.0	0.6	2.5	15	19.5	14	22
1.5	0.7	3.0	21	13.3	21	28
2.5	0.8	3.6	36	7.98	27	38
4	0.8	4.5	52	4.95	34	50
6	0.8	5.2	71	3.30	43	66
10	1.0	6.6	116	1.91	60	89
16	1.0	7.1	172	1.21	78	115
25	1.5	9.5	248	0.780	103	152
35	1.2	10.9	366	0.554	126	189
50	1.4	13.0	510	0.386	157	235
70	1.4	15.1	705	0.272	196	291
95	1.6	17.3	930	0.206	239	350
120	1.6	17.7	1155	0.161	280	410
150	1.6	19.0	1395	0.129	316	473
185	2.0	24.0	1820	0.106	364	945
240	2.2	27.4	2340	0.0801	430	566



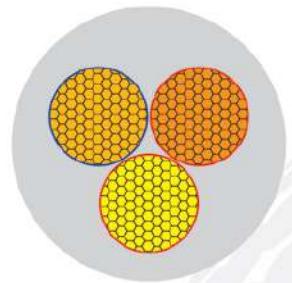


Tirupati Plastomatics Pvt. Ltd.

## MULTICORE CABLES

For indoor Movable installation in dry location

Type	:	CU/PVC/PVC
Standard	:	IEC 60227
Nominal Voltage	:	350 / 500 Volt
Conductor	:	Soft annealed solid or standard copper wires
Insulation	:	PVC compound rated 70°C or 85°C
Jacketing	:	PVC compound (or LSHF)
Packing	:	Plastic spool-coils or non returnable wood drums as per customer requirement



Nominal Cross Section	Normal Insulation Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC Resistance at 20°C	Current Rating	
					Lead in Conducts	Lead in Free Air
mm <sup>2</sup>	mm	mm	kg/km	Ω/km	A	A
2*0.75	0.6	0.8	6.2	56	26.0	15
2*1.0	0.6	0.8	6.7	66	19.5	18
2*1.5	0.7	0.8	7.7	92	13.3	22
2*2.5	0.8	1.0	9.2	136	7.98	30
3*0.75	0.6	0.8	6.6	65	26.0	15
3*1.0	0.6	0.8	7.8	82	19.5	18
3*1.5	0.7	0.9	8.5	116	13.3	22
3*2.5	0.8	1.1	10.1	172	7.98	28
4*0.75	0.6	0.8	6.9	82	26.0	14
4*1.0	0.6	0.8	7.8	92	19.5	17
4*1.5	0.7	1.0	9.5	150	13.3	21
4*2.5	0.8	1.1	11.0	212	7.98	28
5*0.75	0.6	0.9	9.0	110	26.0	14
5*1.0	0.6	0.9	9.6	130	19.5	17
5*1.5	0.7	1.1	10.5	175	13.3	21
5*2.5	0.8	1.2	12.3	250	7.98	28





## WIRING CABLES

### Adalgisa Personal Use

This publication provides details of the following types of wiring cables :

6491X- Single core, PVC insulated non-sheathed cables, available in size range 1 mm<sup>2</sup> to 630 mm<sup>2</sup> and rated 450/750V  
These cables can be considered to have a voltage rating up to 1000V a.c. when installed in fixed protected installation, eg. lighting fitting and inside appliances, switchgear and control gear.



The above wiring cables conform to BS 6004 specification for "PVC insulated cables (non-armoured) for electric power and lighting". The cables also generally satisfy the International Specification IEC 60227 (6491 X only) and German standard VDE 0281 for "PVC insulated cables and cords with rated Voltage not exceeding 750V"

## CONSTRUCTION

### Conductors

Wiring cable conductors are stranded, high conductivity plain annealed copper wire meeting the requirements of class 2 in BS 60228 and IEC 60228 specifications for "Conductors in insulated cables and cords". Wiring cables with solid copper conductors are offered up to 2.5mm<sup>2</sup>.

### Insulation

The insulation of standard wiring cables is PVC grade Type T1 of BS 7655 (formerly BS 6746) Suitable for a maximum continuous conductor operating temperature of 70°C.

### Core Identification

Unless specifically agreed otherwise, insulation colours are in accordance with BS 6004 specifications as follows:

**Finish** Core : Red, Black, Blue, Green/Yellow, Brown, Grey.

Note : Insulation colors other than the above may be manufactured on customer request.

Wiring cables have a smooth finish and are continuously marked with Tirupati Plastomatics by printing or embossing on the external surface.



## RANGE, DIMENSIONS AND WEIGHTS

### SINGLE CORE PVC INSULATED CABLES

Nominal Conductor area mm <sup>2</sup>	PVC insulated, non-sheathed 6491x, 450/750V	
	** Maximum Diameter mm <sup>2</sup>	Approximate Weight kg/km
1.5*	3.2	21
1.5	3.3	23
2.5*	3.9	33
2.5	4.0	35
4	4.6	50
6	5.2	70
10	6.7	120
16	7.8	180
25	9.7	280
35	10.9	370
50	12.8	500
70	14.6	700
95	17.1	970
120	18.8	1190
150	20.9	1470
185	23.3	1840
240	26.6	2400
300	29.6	3010
400	33.2	3820
500	36.9	4900
630	41.1	6100

\* Note: Conductors are solid, all others are stranded. Refer to Table 5 for details.

\*\* These dimensions are Ducab's Maximum and also apply to wire insulated with Heat Resistant PVC, Type TI3 (erstwhile Type 5). The weight (kg/km) of Heat Resistant PVC wiring cables will be slightly less than the standard 6491X Cables shown above.

## PERFORMANCE CHARACTERISTICS

### VOLTAGE RATINGS

The non-sheathed general purpose type 6491X cables are rated 450/750V (450V to earth, 750V between conductors). These cables are considered suitable for fixed protected installations in lighting fittings and inside appliances, switchgear and control gear for voltages up to 1000V a.c. up to 750V to earth d.c..

### CURRENT CARRYING CAPACITIES AT AMBIENT TEMPERATURE 30°C

The tabulated current capacities relate to continuous loading and are also known as the \* full thermal rating' implying that the cables will operate at their maximum conductor continuous temperature of 70°C. The data is extracted from IEE Wiring Regulations (BS 7671).

The tabulated current rating capacities also relate to installation where the overload protection is afforded by fuse to BS 88 or BS 1361 or a miniature circuit breaker. Where the conductor is protected by a semi-enclosed fuse to BS 3036, the size of the conductor is to be such that its tabulated current carrying capacity is not less than the value of the fuse rating adjusted by multiplier 1.38 in addition to the correction factors for ambient temperature, thermal insulation and grouping. For details refer to IEE Wiring Regulations.



## VOLTAGE DROP DATA

For a given cable run, to calculate the voltage drop (in mV), the tabulated value (mV/A/m) has to be multiplied by cable route length in metres and the design current. For three-phase circuits the tabulated mV/A/m values relate to the line Voltage.

For cables of 16mm<sup>2</sup> or less cross sectional area, the inductance can be ignored and mV/A/m values are based On resistance (r) only. For cables of cross sectional area greater than 16mm<sup>2</sup>, mV/A/m values based on resistance (r) and inductance (x) are significant. However for brevity, Table 2, for single core cables of sizes 25mm<sup>2</sup> & 35mm<sup>2</sup>, list (mV/A/m) z, values based on total impedance (z) only.

Where the power factor of the A.C. load is widely different from the cable power factor, use of (mV/A/m) z values for calculating the volt drop may give a pessimistically high value. For detailed information, reference should be made to Appendix 4 of the IEE Wiring Regulations.

### SINGLE CORE PVC INSULATED NON-SHEATHED CABLES- CABLES IN CONDUIT ON A WALL OR CEILING OR IN TRUNKING (REFERENCE METHOD 3)

Table 1

Conductor Cross Sectional Area mm <sup>2</sup>	Current Carrying Capacities (amperes)		Voltage Drop (mV/A/m)		Conductor Cross Sectional Area mm <sup>2</sup>	Current Carrying Capacities (amperes)		Voltage Drop (mV/A/m)					
	2 cables single phase ac or dc	3 or 2 cables three phase ac	2 cables single phase ac	3 or 2 cables three phase ac		2 cables single phase ac or dc	3 or 2 cables three phase ac	2 cables single phase ac			3 or 4 cables three phase ac		
	r	x	z	r	x	z	r	x	z	r	x	z	r
1	13.5	12	44	38	50	151	134	0.95	0.30	1.00	0.81	0.26	0.85
1.5	17.5	15.5	29	25	70	192	171	0.65	0.29	0.72	0.56	0.25	0.61
2.5	24	21	18	15	95	232	207	0.49	0.28	0.56	0.42	0.24	0.48
4	32	28	11	9.5	120	269	239	0.39	0.27	0.47	0.33	0.23	0.41
6	41	36	7.3	6.4	150	300	262	0.31	0.27	0.41	0.27	0.23	0.36
-	-	-	-	-	185	341	296	0.25	0.27	0.37	0.22	0.23	0.32
10	57	50	4.4	3.8	240	400	346	0.195	0.26	0.33	0.17	0.23	0.29
16	76	68	2.8	2.4	300	458	394	0.160	0.26	0.31	0.14	0.23	0.27
*25	101	89	1.8	1.55	400	546	467	0.130	0.26	0.29	0.12	0.22	0.25
*35	125	110	1.3	1.10	500	626	533	0.110	0.26	0.28	0.10	0.22	0.25
					630	720	611	0.094	0.25	0.27	0.08	0.22	0.24

\*Voltage drop for sizes 25mm<sup>2</sup> and 35mm<sup>2</sup> are based on total impedance 'z' only.

For 'r' and 'x' data, IEE Wiring Regulation should be referred to.

Note: data in the above table is based on IEE Wiring Regulations. The Current carrying capacities of Heat Resistant PVC insulated cables are higher, please refer to Technical Department if data is required.

## THERMAL INSULATION

Current rating pertaining to cables or cable conduits totally surrounded by thermally insulating Material are not included in the above tables. For such Situations, in the absence of precise information, a rating factor of 0.5 may be applied to the appropriate current ratings.

For Multicore cables, current ratings of cables installed in thermally insulated ceiling s but in contact with a thermally conductive surface on one side are stated. For similar information applicable to single-core cables reference Should be made to the IEE Wiring Regulations.



## RATING FACTORS

FOR AMBIENT TEMPERATURE OTHER THAN 30°C, THE TABULATED CURRENT RATINGS  
SHOULD BE ADJUSTED BY FACTORS AS FOLLOWS:

Table 3

Method of Installation		Correction Factor												
		Number of circuite or multicore cables												
		25	30	35	40	45	50	55	60	65	70	75	80	85
Overload protection afforded by device other than semi-enclosed fuse to BS 3036	Heat resistance PVC (90°C)	1.03	1.0	0.97	0.94	0.91	0.87	0.50	0.84	0.76	0.71	0.61	0.5	0.35
	Ordinary PVC (70°C)	1.03	1.0	0.94	0.87	0.79	0.71	0.71	0.50	0.35	-	-	-	-
Semi-enclosed fuse to BS 3036 (formerly coarse excess Current protection)	Heat resistance PVC (90°C)	1.03	1.0	0.97	0.94	0.91	0.87	0.90	0.80	0.76	0.72	0.68	0.63	0.49
	Ordinary PVC (70°C)	1.03	1.0	0.97	0.94	0.91	0.87	0.73	0.69	48	-	-	-	-

\* These factors are applicable only to ratings in Table 2.

## CORRECTION FACTORS FOR GROUPS OF CABLES (REF. IEE WIRING REGULATION)

Table 4

Method of Installation		Correction Factor													
		Number of circuite or multicore cables													
		2	3	4	5	6	7	8	9	10	12	14	16	18	20
Enclosed in conductor trunking (Method 3 or 4) or bunched and clipped directly to non-metallic surface (Method 1)		0.80	0.70	0.65	0.65	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.39	0.38
Single layer multicore to a non matalic Surface (Method 1)	Touching	0.85	0.79	0.75	0.60	0.72	0.72	0.71	0.71	-	-	-	-	-	-
	Spaced*	0.94	0.90	0.90	0.75	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer multicore on a perforated metal cable tray, vertical or horizontal (Method 1)	Touching	0.86	0.81	0.77	0.90	0.74	0.73	0.73	0.73	0.71	0.70	-	-	-	-
	Spaced*	0.91	0.89	0.88	0.87	0.87	-	-	-	-	-	-	-	-	-
Single layer single core on a perforated metal cable tray touching (Method 11)	Horizontal	0.90	0.85	-	-	-	-	-	-	-	-	-	-	-	-
	Vertical	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-
Single layer multicore touching on ladder supports (method 13)		0.86	0.82	0.80	0.79	0.79	0.78	0.78	0.78	-	-	-	-	-	-

" 'Spaced' means a clearance between adjacent surfaces of at least one cable diameter (D). Where the horizontal clearances between adjacent cables exceeds 2D no correction factor need be applied.

## Notes to Table 4:

Current rating pertaining to cables or cable conduits totally surrounded by thermally insulating Material are not included in the above tables. For such Situations. in the absence of precise information, a rating factor of 0.5 may be applied to the appropriate current ratings.

For Multicore cables, current ratings of cables installed in thermally insulated ceiling s but in contact with a thermally conductive surface on one side are stated. For similar information applicable to single-core cables reference Should be made to the IEE Wiring Regulations.



## CONDUCTOR RESISTANCE

Nominal Conductor Area mm <sup>2</sup>	Maximum Diameter of Conductor mm	Maximum conductor resistance per km at 20°C Ω	Nominal Conductor Area mm <sup>2</sup>	Maximum Diameter of Conductor mm	Maximum conductor resistance per km at 20°C Ω
1.5*	1.38	12.1	50	8.30	0.387
1.5	1.89	12.1	70	10.00	0.268
2.5*	1.78	7.41	98	11.70	0.193
20.5	2.01	7.41	120	13.15	0.153
-	-		150	14.45	0.124
4	2.55	4.61	185	16.30	0.0991
6	3.12	3.08	240	18.75	0.0754
10	4.05	1.83	300	21.00	0.0601
16	4.85	1.15	400	23.90	0.0470
25	6.15	0.727	500	26.40	0.0366
35	7.25	0.524	630	31.70	0.0283

## CONDUCTOR SHORT CIRCUIT RATINGS

Short circuit rating of copper conductor shall be calculated using following formula:

Short circuit current  $I = kA/\sqrt{t}$

$$k = 0.115$$

A = Cross sectional Area of conductor

t= Duration in seconds

$$I = 0.115 \times 300 / \sqrt{1} \\ = 34.5 \text{kA/sec.}$$

e.g. short rating of 300mm<sup>2</sup> Cu conductor for 1 second.

as short circuit ratings derived from above formula based on the PVC insulated cable being fully loaded at the start of the short circuit conductor temperature of 70°C and final conductor temperature of 160°C.

## WIRING CABLE INSTALLATION

Wiring cables should be installed in accordance with IEE Wiring Regulations, or local installation regulations.

Minimum internal radius at bends:

CABLE DIAMETER	Minimum Internal Radius
Up to 10mm	3 x Cable Diameter
Exceeding 10mm but less than 25mm	3 x Cable Diameter
Exceeding 25mm	3 x Cable Diameter



## CONTROL CABLES

### Introduction

Control Cables are used for outdoor/indoor installations for transmitting signals and connecting control units in the industry, railways, and traffic signals. Control cables are usually made of multiple cores such as 7, 10, 12, 14, and 16 cores; and Control cables may be armored or unarmored.

In this catalogue, we cover all technical aspects of Tirupati Plastomatics Pvt. Ltd. Control Cables. We included design considerations such as number of cores, type of insulation material, insulation thickness, sheath material, and sheath thicknesses. Cables Electrical Parameters such as conductor DC resistance and current ratings are included as well.

Tirupati Plastomatics Pvt. Ltd. Control Cables are manufactured based on international standards such as IEC 60502-1. We are also capable of manufacturing according to client requirements and needs.



Conductor

PVC Insulation

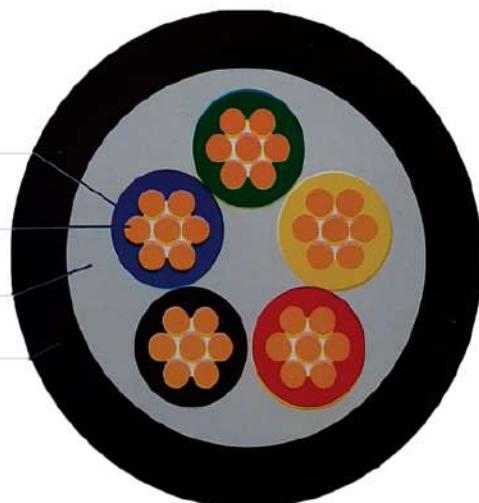
PVC Sheath

Conductor

PVC Insulation

Bedding

PVC Sheath





## General Information

### Standards

The cables described in this catalogue are all standard types, and their performances has been proved in operation. Construction and tests are in accordance with the recommendation of IEC publications where applicable.

Control cables in accordance to other standards (e.g. BS, VDE, NEMA) can be manufactured upon customer's request.

### Variation in Production and Delivery Options

The provided data is approximate and subject to manufacturing tolerance

Delivery length tolerance is + 5%

### Variation in Production and Delivery Options

Standard embossed outer jacket marking consisting of:

- 1- Name of manufacturer
- 2- Type designation, size of conductor, rated voltage and standard
- 3- Continuous length marking every meter
- 4- Year of manufacture

## Laying Information

### Minimum Bending Radius During Installation

During laying, the bending radius should not be smaller than values given below.

The radius depends on the outer diameter ( $D_o$ ) of the cable.

### PVC and XLPV insulated Cables

Conductor	Construction	Outer Diameter (mm)	Min. Radius
Stranded Copper	Armoured or Unarmoured	Any	$8 D_o$

### Electricity Parameters of the Cables

#### DC Resistance of Conductor

The Maximum DC resistance values of conductors at 20°C are as per "IEC 60228" Standard.

DC resistances per unit length of the conductor at other conductor temperature is given

By:

$$R = R_o [a + \alpha_{200C} (t - 20^\circ\text{C})]$$

Where:

$R$  = DC resistance at temperature  $t^\circ\text{C}$   $\Omega/\text{km}$

$R_o$  = DC resistance at temperature 20°C  $\Omega/\text{km}$  (given in the relative tables for each type of cable)

$t$  = Conductor coefficient at °C

$\alpha_{200C}$  = Temperature coefficient at 20°C 1/C

For copper conductor  $\alpha_{200C} = 0.00393$



**Tirupati Plastomatics Pvt. Ltd.**

## SINGLE CORE

For indoor fixed installation in dry location

Type	:	CU/PVC/PVC
Standard	:	IEC 60502-1
Nominal Voltage	:	0.6 / 1 KV
Conductor	:	Soft annealed solid or standard copper wires (or Solid Copper)
Insulation	:	PVC compound rated 70°C or 85°C (or XLPE or LSHF)
Jacketing	:	PVC Compound (or LSHF)



### Technical Information

Nominal Cross Section	Normal Insulation Thickness	Normal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC Resistance at 20°C	Current Rating		
						Lead in Conducts	Lead in Ducts	Lead in Free Air
<b>n x mm<sup>2</sup></b>	<b>mm</b>	<b>mm</b>	<b>mm</b>	<b>kg/km</b>	<b>Ω/km</b>	<b>A</b>	<b>A</b>	<b>A</b>
5*1.5	0.8	1.8	13.0	237	12.10	25	22	19
7*1.5	0.8	1.8	13.1	282	12.10	22	20	17
10*1.5	0.8	1.8	16.4	368	12.10	19	18	16
12*1.5	0.8	1.8	16.7	438	12.10	18	16	15
14*1.5	0.8	1.8	18.3	452	12.10	16	15	13
16*1.5	0.8	1.8	19.5	932	12.10	15	14	13
19*1.5	0.8	1.8	19.6	610	12.10	14	13	11
24*1.5	0.8	1.8	22.8	726	12.10	12	11	11
30*1.5	0.8	1.8	24.0	865	12.10	11	14	9
37*1.5	0.8	1.8	25.7	1050	12.10	10	9	8
5*2.5	0.8	1.8	14.0	305	7.41	33	29	29
7*2.5	0.8	1.8	15.2	365	7.41	30	26	22
10*2.5	0.8	1.8	18.3	485	7.41	27	23	20
12*2.5	0.8	1.8	19.5	530	7.41	20	22	19
14*2.5	0.8	1.8	19.7	640	7.41	22	20	17
16*2.5	0.8	1.8	20.4	700	7.41	20	18	15
19*2.5	0.8	1.8	22.5	840	7.41	19	17	15
24*9.5	0.8	1.8	20.3	990	7.41	18	16	13
30*2.5	0.8	1.8	26.7	1230	7.41	16	14	12
37*2.5	0.8	1.9	30.0	1530	7.41	14	13	11
5*4	1.0	1.8	17.9	528	4.61	42	36	34
7*4	1.0	1.8	19.3	650	4.61	38	33	30
10*4	1.0	1.8	22.6	725	4.61	34	30	27
12*4	1.0	1.8	24.7	470	4.61	31	27	29
14*4	1.0	1.8	29.3	945	4.61	28	24	22
16*4	1.0	1.8	20.8	1140	4.61	27	23	21
19*4	1.0	1.8	28.4	1520	4.61	25	21	20
24*4	1.0	1.9	31.5	1590	4.61	22	19	17
30*4	1.0	2.0	34.4	1960	4.61	20	17	15
37*4	1.0	2.1	37.0	2500	4.61	18	16	14





**Tirupati Plastomatics Pvt. Ltd.**

## Multicore Cable

For indoor fixed installation in dry location

Type	:	CU/PVC/STA/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	0.6 / 1 KV
Conductor	:	Soft annealed solid or standard copper wires (or Solid Copper)
Insulation	:	PVC compound rated 70°C or 85°C (or XLPE or LSHF)
Beading	:	PVC Compound (or LSHF)
Armouring	:	Steel Tape
Jacketing	:	PVC compound (or LSHF)



### Technical Information

Nominal Cross Section	Normal Insulation Thickness	Normal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC Resistance at 20°C	Current Rating			
						Lead in Conducts	Lead in Ducts	Lead in Free Air	
n x mm <sup>2</sup>	mm	mm	mm	kg/km	Ω/km	A	A	A	
7*1.5	0.8	0.2	1.8	16.1	440	12.10	22	20	17
10*1.5	0.8	0.2	1.8	19.0	555	12.10	19	18	16
12*1.5	0.8	0.2	1.8	20.0	630	12.10	18	16	15
14*1.5	0.8	0.2	1.8	20.3	670	12.10	16	15	14
16*1.5	0.8	0.2	1.8	21.1	760	12.10	15	14	13
19*1.5	0.8	0.2	1.8	22.2	825	12.10	14	13	12
24*1.5	0.8	0.2	1.8	25.8	1025	12.10	12	12	11
30*1.5	0.8	0.2	1.8	27.0	1190	12.10	11	11	9
37*1.5	0.8	0.2	1.8	28.7	1340	12.10	10	9	8
5*2.5	0.8	0.2	1.8	16.3	465	7.41	33	29	25
7*2.5	0.8	0.2	1.8	17.0	530	7.41	30	26	22
10*2.5	0.8	0.2	1.8	20.0	820	7.41	27	23	20
12*2.5	0.8	0.2	1.8	21.0	860	7.41	25	22	19
14*2.5	0.8	0.2	1.8	22.5	885	7.41	22	20	17
16*2.5	0.8	0.2	1.8	24.5	1110	7.41	20	18	16
19*2.5	0.8	0.2	1.8	26.3	1170	7.41	19	17	15
24*9.5	0.8	0.2	1.8	28.5	1355	7.41	18	16	13
30*2.5	0.8	0.2	1.9	31.5	1910	7.41	16	14	12
37*2.5	0.8	0.2	1.9	32.5	1960	7.41	14	13	11
5*4	0.8	0.2	1.8	18.7	635	4.61	42	36	34
7*4	1.0	0.2	1.8	20.0	740	4.61	38	33	30
10*4	1.0	0.2	1.8	24.5	965	4.61	34	30	27
12*4	1.0	0.2	1.8	25.5	1125	4.61	31	27	25
14*4	1.0	0.2	1.8	26.4	1275	4.61	28	24	22
16*4	1.0	0.2	1.8	27.8	1400	4.61	27	23	21
19*4	1.0	0.2	1.8	29.5	1620	4.61	25	21	20
24*4	1.0	0.2	2.0	34.6	2040	4.61	22	19	17
30*4	1.0	0.2	2.0	36.5	2670	4.61	2	17	15
37*4	1.0	0.2	2.2	41.0	3260	4.61	18	16	14



**Tirupati Plastomatics Pvt. Ltd.**

## Multicore Cable

For indoor fixed installation in dry location

Type	:	CU/PVC/STA/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	0.6 / 1 KV
Conductor	:	Soft annealed solid or standard copper wires (or Solid Copper)
Insulation	:	PVC compound rated 70°C or 85°C (or XLPE or LSHF)
Beading	:	PVC Compound (or LSHF)
Armouring	:	Steel Tape
Jacketing	:	PVC compound (or LSHF)



### Technical Information

Nominal Cross Section	Normal Insulation Thickness	Normal Insulation Thickness	Normal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC Resistance at 20°C	Current Rating		
							Lead in Conducts	Lead in Ducts	Lead in Free Air
$n \times \text{mm}^2$	mm	mm	mm	mm	kg/km	$\Omega/\text{km}$	A	A	A
7*1.5	0.8	0.2	1.8	17.0	595	12.10	22	20	17
10*1.5	0.8	0.2	1.8	20.0	760	12.10	19	18	16
12*1.5	0.8	0.2	1.8	20.5	850	12.10	18	16	15
14*1.5	0.8	0.2	1.8	24.5	1150	12.10	16	15	14
16*1.5	0.8	0.2	1.8	26.0	1200	12.10	15	14	13
19*1.5	0.8	0.2	1.8	28.0	1360	12.10	14	13	12
24*1.5	0.8	0.2	1.8	29.0	1550	12.10	12	12	11
30*1.5	0.8	0.2	1.8	31.0	1730	12.10	11	11	9
37*1.5	0.8	0.2	1.8	37.0	2150	12.10	10	9	8
5*2.5	0.8	0.2	1.8	18.5	610	7.41	33	29	25
7*2.5	0.8	0.2	1.8	21.5	700	7.41	30	26	22
10*2.5	0.8	0.2	1.8	22.5	870	7.41	27	23	20
12*2.5	0.8	0.2	1.8	24.7	970	7.41	25	22	19
14*2.5	0.8	0.2	1.8	26.0	1430	7.41	22	20	17
16*2.5	0.8	0.2	1.8	27.0	1515	7.41	20	18	16
19*2.5	0.8	0.2	1.8	31.5	1610	7.41	19	17	15
24*9.5	0.8	0.2	1.8	31.0	2200	7.41	18	16	13
30*2.5	0.8	0.2	1.9	34.5	1460	7.41	16	14	12
37*2.5	0.8	0.2	1.9	39.7	2550	7.41	14	13	11
5*4	0.8	0.2	1.8	21.0	820	4.61	42	36	34
7*4	1.0	0.2	1.8	27.0	960	4.61	38	33	30
10*4	1.0	0.2	1.8	27.8	1495	4.61	34	30	27
12*4	1.0	0.2	1.8	29.0	1800	4.61	31	27	25
14*4	1.0	0.2	1.8	30.5	1820	4.61	28	24	22
16*4	1.0	0.2	1.8	32.0	2050	4.61	27	23	21
19*4	1.0	0.2	1.8	38.0	2270	4.61	25	21	20
24*4	1.0	0.2	2.0	38.0	2995	4.61	22	19	17
30*4	1.0	0.2	2.0	40.0	3570	4.61	2	17	15
37*4	1.0	0.2	2.2	42.5	3930	4.61	18	16	14





## General information

### Selecting A Power Cables

The following factors are important when selecting a suitable cable construction which is required to transport electrical energy from the power station to the consumer:

- Maximum operating voltage
- Insulation level
- Frequency
- Load to be carried
- Magnitude and duration of possible overload
- Magnitude and duration of short-circuit current
- Voltage drop
- Length of line
- Mode of installation
  - \* underground (direct or in ducts)
  - \* In Air
- Chemical and physical properties of soil
- Max. and min. ambient air temperature and soil temperatures
- Specification requirements to be met

### Voltage

The standard rated voltage of a cable is denoted by  $U_0/U$  ( $U_m$ ), i.e. "0.6/1 (1.2)" where:

$U$ : is the rated power-frequency voltage between conductor and earth  
erento febpellleragie oa $9^{\circ}$  between conductors.

$U_m$ : is the maximum continuously permissible operating voltage of a cable at any time or in any part of the network

### Variarion in Production and Delivery Options

- The provided data are approximate
- Delivery length tolerance is  $\pm 5\%$  and subject of manufacturing tolerance
- Other sizes are available upon request

### Jacket Marking

Standard embossed outer jacket marking consisting of:

- 1- Name of manufacturer
- 2- Type of designing, size of conductor, rated voltage and standrad.
- 3- Continuous lenth marking every meter
- 4- Year of manufacture



## Laying Information

### Minimum Bending Radius During Installation

During laying, the bending radius should not be smaller than values given below  
The radius depends on the outer diameter (Do) of the cable.

#### PVC and XLPE Insulated Cables up to 3.6 kV

Conductor	Construction	Outer diameter (mm)	Min. Radius
Standard aluminium or Copper	Armoured or Unarmoured	Any	8Do

#### Maximum Tensile Forces During laying

Conductor	Construction	Outer diameter (mm)	Min. Radius
With Pulling head attached to the conductor	All Types of cables	$p = \sigma \cdot A$	$\sigma = 50 \text{ N/mm}^2$ (Copper conductor) $\sigma = 30 \text{ N/mm}^2$ (Al conductor)
With Pulling Stocking	Unarmoured cables Armoured cables	$p = \sigma \cdot A$ $p = k \cdot d^2$	$\sigma = 50 \text{ N/mm}^2$ (Copper conductor) $\sigma = 30 \text{ N/mm}^2$ (Al conductor) $k = 9 \text{ N/mm}^2$

P = Pull in N

A = Total cross sectional area in  $\text{mm}^2$  of all conductors

d = Outside diameter of the cable in mm

$\sigma$  = Permissible tensile stress of conductor in  $\text{N/mm}^2$

k = Emperically derived factor in  $\text{N/mm}^2$



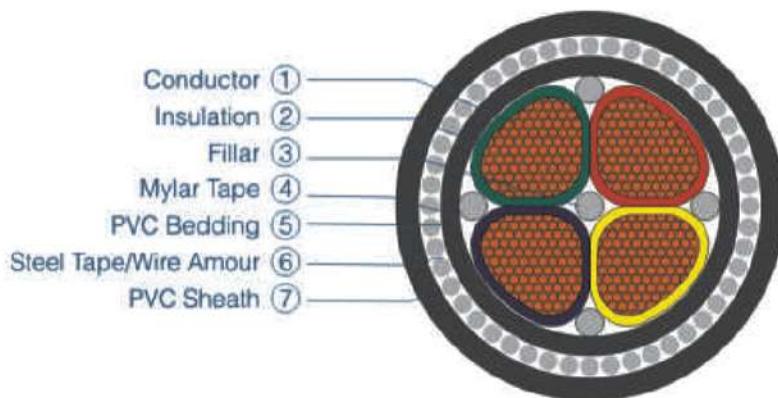
## LOW VOLTAGE CABLES

### INTRODUCTION

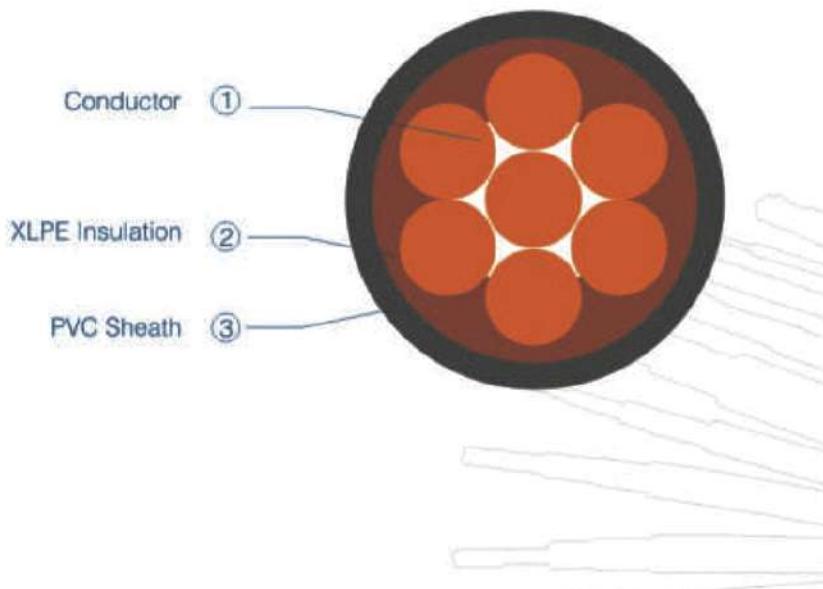
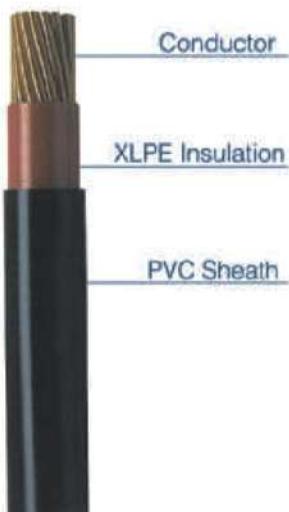
Low Voltage Power Cables are used to transmit electrical energy from one location to another. Low Voltage Power Cables are usually employed in the distribution process of electricity to various loads such as households.

In this catalogue, we cover all technical aspects of Tirupati Plastomatics Pvt. Ltd. Low Voltage Power Cables. We included design considerations such as type of insulation material (i.e. PVC and XLPE), insulation thickness, type of armour, armour dimensions, sheath material and sheath thickness. Cables Electrical Parameters such as Conductor DC Resistance and current ratings are included as well.

Tirupati Plastomatics Pvt. Ltd. Low Voltage Power Cable are manufactured based on international standards such as IEC 60502-1, BS 5467 and BS 6346. We are also capable of manufacturing according to client requirements and needs.



### Sector Shape 4 Cores



### Round Shape 1 Cores



## Electrical Parameters of the Cables

### DC Resistance of Conductor

The Maximum DC resistance values of conductors at 20°C are as per "IEC 60228" standard.

DC resistance per unit length of the conductor at other conductor temperature is given by:

$$R = R_0 [1 + \alpha_{20^\circ\text{C}} (t - 20^\circ\text{C})]$$

Where :

R = DC resistance at temperature t °C Ω/km

R<sub>0</sub> = D.C. resistance at temperature 20°C

Ω/km (given in the relative table for each type of cable)

t = Conductor temperature °C

$\alpha_{20^\circ\text{C}}$  = Temperature coefficient at 20°C 1/°C

For copper conductor  $\alpha_{20^\circ\text{C}} = 0.00393$

For aluminum conductor  $\alpha_{20^\circ\text{C}} = 0.00403$

### A.C. Resistance of Conductor

The AC Resistance per unit length of the conductor (effective resistance) at its maximum operating temperature is made up of the DC resistance at this temperature and the extra resistance which takes into account additional losses caused by the current displacement in the conductor (skin effect, proximity effect). The AC resistance is given in the relative tables for each type of cable.

### Inductance

The values of the inductance for both multi cores and three single core cables have been calculated based on the following equation

$$L = K + 0.2 \ln(2S/d) \text{ (mH/km)}$$

Where:

K = a constant relating to the conductor formation (mH/km).

d = the conductor diameter (mm)

S = axial spacing between conductors for cables in trefoil formation (mm)

= 1.26 x axial spacing between conductors for cables in flat formation (mm)

The values for inductance of single core cables has been calculated based on one cable diameter between cables in flat formation.

### Operation capacitance

The values of operating capacitance for cables has been calculated based on the following presump-

$$C = \frac{\epsilon_r}{18 \ln(D/d)} \text{ (μF/km)}$$

Where:

$\epsilon_r$  = Relative permittivity of insulation

D = External diameter of insulation (mm)

d = Conductor diameter (mm)

### Operation Temperature for XLPE Insulated Cables

90°C for continuous normal operation

105°C for emergency overload conditions.

250°C for short circuit conditions.



## Current Ratings

### Recommendations for Current Ratings

The current rating of power cables is defined by the maximum intensity of current (in amperes), which can flow continuously through the cable, under permanent loading conditions without any risk of damaging the insulation or deterioration of its electrical properties.

Current carrying capacities have been calculated in accordance with IEC 60287 (calculation of the continuous continuous current rating of cables)

-The values given in the tables are valid for one circuit in three phase system under conditions specified. For grouping cables rating factors must be used.

-It is to be observed that the current-carrying capacities presented in TPPL technical data sheets are intended as a guide to assist operating engineers in selecting cables for safety and reliability.

- Basic assumptions and conditions of installation :

\* Ambient groundtemperature : 20°C

\* Ambient air temperature : 30°C

\* Depth of cable burial : 1.0m a

\* Thermal resistivity of soil : 120°C cm.W

- Cables in air are assumed to be protected from direct solar radiation.

- Single core cables are installed as indicated in the technical information table. Spacing between cables in flat formation is assumed to be one cable diameter.

For three and four core cables, it is usual to assume the same current carrying capacity for four cores cables as for three core cables. Out Calculated values are based actually on three core cables. These values are suitable with enough accuracy also for four cores cables inmost cases.

- The inner diameter of ducts has been assumed to beat least 1.5 times the diameter of the cables.

To obtain the maximum current arryng capacity of cable operating at different conditions from the standards, you have to multiply the values of the current given in the technical information for the corresponding cable by the ratig factors mentioned in the tables from 1:0 1:1,,as follows:

$I_a = Kt \cdot I_s$  is in amperes

Where

$I_a$  : Current rating at actual operating conditions ( amperes)

$I_s$  : Current rating at standard operating conditions ( amperes)

$Kt$  : Rating factor given in the tha table 1 to 11, it has to be noted that  $Kt$  is tha total rating

factor :  $Kt = K1 \cdot K2 \dots Kn$

You may have a multiplication of so many partial rating factors, as may as the difference of laying and operating conditions from standard conditions



## Voltage Drop

When current flows in a cable conductor, there is a voltage drop between the ends of the conductor which is the product of the current and the impedance. The following equations should be used to calculate the voltage drop:

1-Single phase system

$$Vd = 2(R \cos\phi + X \sin\phi) \text{ (Volt/amp/meter)}$$

2-Three phase system

$$Vd = \sqrt{3} (R \cos\phi + X \sin\phi) \text{ (Volt/amp/meter)}$$

Where :

$Vd$  = Voltage drop (V/A.m)

$R$  = AC resistance of conductor at a maximum conductor temperature ( $\Omega/\text{km}$ )

$X$  = Inductive reactance of cable ( $\Omega/\text{km}$ )

$\cos\phi$  = power factor of load

\* Voltage drop data for L.V Cables are tabulated in tables 16 to 23

## Cable Short Circuit Capacity

The permissible short-circuit as presented in tables 12 to 15 are calculated in accordance with IEC 724, which are based on the following conditions:

1-Short circuit starts from the maximum operating temperature.

2-Maximum temperature during short circuit XLPE = 250°C, PVC = 160°C

3-Maximum short circuit current duration is 5 seconds.

The short - circuit current ( $I$ ) shall be calculated from the formula.

$$I_s = \frac{K^2 \times S^2}{T} \times \ln \left[ \frac{\theta_i + \beta}{\theta_o + \beta} \right]$$

Where :

$I_s$  = Short circuit current (A)

$T$  = Duration of short circuit (Second)

$K$  = Constant for the material of the conductor

$S$  = Area of conductor ( $\text{mm}^2$ )

$\theta_s$  = Final temperature ( $^{\circ}\text{C}$ )

$\theta_o$  = Initial temperature ( $^{\circ}\text{C}$ )

$\beta$  = Reciprocal of the temperature coefficient of resistance () of the conductor.



## Current Ratings

### Recommendations for Current Ratings

The current rating of power cables is defined by the maximum intensity of current (in amperes), which can flow continuously through the cable, under permanent loading conditions without any risk of damaging the insulation or deterioration of its electrical properties.

-Current carrying capacities have been calculated in accordance with IEC 60287 (calculation of the continuous current rating of cables)

-The values given in the tables are valid for one circuit in three phase system under conditions specified. For grouping cables rating factors must be used.

-It is to be observed that the current carrying capacities presented in TPPL technical data sheets are intended as a guide to assist operating engineers in selecting cables for safety and reliability.

-Basic assumptions and conditions of installation :

\* Ambient ground temperature : 20°C

\* Ambient air temperature : 30°C

\* Depth of cable burial : 1.0m

\* Thermal resistivity of soil : 120°C cm.W

-Cables in air are assumed to be protected from direct solar radiation.

-Single core cables are installed as indicated in the technical information table. Spacing between cables in flat formation is assumed to be one cable diameter.

-For three and four core cables, it is usual to assume the same current carrying capacity for four cores cables as for three core cables. Our calculated values are based actually on three core cables. These values are suitable with enough accuracy also for four cores cables in most cases.

- The inner diameter of ducts has been assumed to be at least 1.5 times the diameter of the cables.

To obtain the maximum current carrying capacity of cable operating at different conditions from the standards, you have to multiply the values of the current given in the technical information for the corresponding cable by the rating factors mentioned in the tables from 1 to 11, as follows:

$$I_a = K_t \cdot I_s \text{ in amperes}$$

Where:

$I_a$  : Current rating at actual operating conditions (amperes)

$I_s$  : Current rating at standard operating conditions (amperes)

$K_t$  : Rating factor given in the tables 1 to 11. It has to be noted that  $K_t$  is the total rating factor  $K_t = K_1 K_2 \dots K_n$

You may have a multiplication of so many partial rating factors, as may as the difference of laying and operating conditions from standard conditions.

**Table 1****Rating Factors K for Variation in Ground Temperature**

Ground Temperature °C	20	25	30	35	40	45	50	55
PVC cables rated 70°C	1.00	0.95	0.90	0.84	0.78	0.71	0.63	0.54
PVC cables rated 85°C	1.00	0.96	0.92	0.87	0.83	0.78	0.73	0.67
XLPE cables rated 90°C	1.00	0.92	0.92	0.88	0.84	0.79	0.75	0.70

**Table 2****Rating Factors K for Variation in Air Temperature**

Air Temperature °C	25	30	35	40	45	50	55
PVC cables rated 70°C	1.07	1.00	0.93	0.87	0.79	0.70	0.61
PVC cables rated 85°C	1.04	1.00	0.95	0.90	0.85	0.80	0.74
XLPE cables rated 90°C	1.04	1.00	0.96	0.91	0.87	0.82	0.76

**Table 3****Rating Factors K for Variation in Ground Depth**

Depth of Laying (m)	0.6	0.7	0.8	0.9	1.0	1.1	1.2
k	1.05	1.03	1.02	1.01	1.0	0.99	0.98

**Table 4****Rating Factors K for Variation in Soil Resistivity**

Soil Resistivity (°C. cm/W)	80	90	100	120	150	200	250
k	1.17	1.12	1.07	1.0	0.91	0.80	0.73

**Table 5****Rating Factors K for Variation of Max. Operating Temperatures for PVC Insulating Cables**

PVC Rated Temperature	70	85	105
Rating Factor	0.84	1.00	1.18

**Table 6**

**Trefoil or Flat Formation Derating Factors for Three Single Core Cable Laid Direct in Ground**

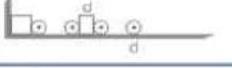
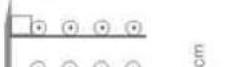
Number of Circuits	Spacing Spacing			Spacing Spacing		
	Trefoil Formation			Trefoil Formation		
	Touching		Spacing = 0.15 M	Spacing = 0.30 M		
NR	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.77	0.80	0.82	0.85	0.88	0.91
3	0.66	0.69	0.73	0.76	0.80	0.83
4	0.60	0.63	0.68	0.71	0.74	0.77
5	0.56	0.59	0.64	0.67	0.72	0.75
6	0.53	0.57	0.61	0.64	0.70	0.73

**Table 7**

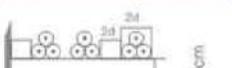
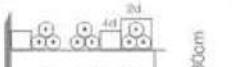
**Trefoil or Flat Formation Derating Factors for Multi-Core Cables Laid Direct in Ground**

Number of Cables	Spacing Spacing			Flat Formation		
	Trefoil Formation			Flat Formation		
	Touching		Spacing = 0.15 M	Spacing = 0.30 M		
NR	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.81	0.81	0.87	0.87	0.91	0.91
3	0.69	0.70	0.76	0.78	0.82	0.84
4	0.62	0.63	0.72	0.74	0.77	0.81
5	0.58	0.60	0.66	0.70	0.73	0.78
6	0.54	0.56	0.63	0.67	0.70	0.76

**Table 8****Flat Formation Derating Factors for Three Single Core Cables Laid in Free Air**

Clearance = Cable diameter ( $d$ ) Clearance from the wall 2 cm	Number of circuits			$\geq 2\text{cm}$ 
	1	2	3	
Laid on the Floor	0.92	0.89	0.88	
Number of troughs				$\geq 2\text{cm}$ 
Laid cables	1	0.92	0.89	0.88
troughs	2	0.87	0.84	0.83
(circulation of air is restricted)	3	0.84	0.82	0.81
	6	0.82	0.80	0.79
Number of racks				$\geq 2\text{cm}$ 
Laid	1	1.00	0.97	0.96
on cable racks	2	0.97	0.94	0.93
	3	0.96	0.96	0.92
	6	0.94	0.91	0.90
Arranged near the wall	0.94	0.91	0.89	$\geq 2\text{cm}$ 
Arranged on the wall	0.89	0.86	0.84	$\geq 2\text{cm}$ 

**Table 9****Trefoil Touching Formation Derating Factors for Three Single Core Cables Laid in Free Air**

Clearance = 2 ( $d$ ) Clearance from the wall 2 cm	Number of circuits			$\geq 2\text{cm}$ 
	1	2	3	
Laid on the Floor	0.95	0.90	0.88	
Number of troughs				$\geq 2\text{cm}$ 
Laid cables	1	0.95	0.90	0.88
troughs	2	0.90	0.85	0.83
(circulation of air is restricted)	3	0.88	0.83	0.81
	6	0.86	0.81	0.79
Number of racks				$\geq 2\text{cm}$ 
Laid	1	1.00	0.97	0.96
on cable racks	2	0.97	0.94	0.93
	3	0.96	0.93	0.92
	6	0.94	0.91	0.90
Arrangements for which reduction of the current is not necessary				$\geq 2\text{cm}$ 



**Table 10**

**Horizontal or Vertical Formation Derating Factor For Multi-Core Cables Laid Free Air**

Clearance = Cable diameter (d)	Number of circuits					
Clearance from the wall $\geq 2$ cm	1	2	3	6	9	
Laid on the Floor	0.95	0.90	0.88	0.85	0.84	
Number of troughs						
Laid cables	1	0.95	0.90	0.88	0.85	0.84
troughs	2	0.90	0.85	0.83	0.81	0.80
(circulation of air is restricted)	3	0.88	0.83	0.81	0.79	0.78
	6	0.86	0.81	0.79	0.77	0.76
Number of racks						
Laid	1	1.00	0.98	0.96	0.93	0.92
on cable racks	2	1.00	0.95	0.93	0.90	0.89
	3	1.00	0.94	0.92	0.89	0.88
	6	1.00	0.93	0.90	0.87	0.86
Arranged near the wall	1.00	0.93	0.90	0.87	0.86	
Arrangements for which reduction of the current is not necessary	Clearnace from the wall $\geq 2$ cm			Clearnace between cables $\geq 2 d$		

**Table 11**

**Derating Factors for Multi-Core Cables Touching and in Contact with the Wall in Free Air**

Clearance touching troughs and contact with wall	Number of circuits					
Laid on the ground	1	2	3	6	9	
Number of troughs						
Laid cables	1	0.95	0.84	0.80	0.75	0.73
troughs	2	0.95	0.80	0.76	0.71	0.69
(circulation of air is restricted)	3	0.95	0.78	0.74	0.70	0.68
	6	0.95	0.76	0.72	0.68	0.66
Number of racks						
Laid	1	0.95	0.84	0.80	0.75	0.73
on cable racks	2	0.95	0.80	0.76	0.71	0.69
	3	0.95	0.78	0.74	0.70	0.68
	6	0.95	0.76	0.72	0.68	0.66
Arranged near the wall	0.95	0.78	0.73	0.68	0.66	

**Table 12**

**Short Circuit Current for Copper Conductors - XLPE  
Insulated (KA) at (90/250)°C**

Area (mm <sup>2</sup> )	Time (s)									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
16	7.24	5.12	4.18	3.62	3.24	2.29	1.62	1.32	1.14	1.02
25	11.31	8.00	6.53	5.66	5.06	3.58	2.53	2.07	1.79	1.60
35	15.84	11.20	9.14	7.92	7.08	5.01	3.54	2.89	2.50	2.24
50	22.62	16.00	13.06	11.31	10.11	7.15	5.06	4.13	3.58	3.20
70	31.67	22.40	18.29	15.84	14.16	10.02	7.08	5.78	5.01	4.48
95	42.98	30.39	24.82	21.49	19.22	13.59	9.61	7.85	6.80	6.08
120	54.30	38.39	31.34	27.15	24.28	17.17	12.14	9.91	8.59	7.68
150	67.87	47.99	39.19	33.94	30.35	21.46	15.18	12.39	10.73	9.60
185	83.71	59.19	48.33	41.85	37.42	26.47	18.72	15.28	13.24	11.94
240	108.59	76.79	62.70	54.30	48.56	34.34	24.28	19.83	17.17	15.36
300	135.74	95.98	78.37	67.87	60.71	42.93	30.35	24.78	21.46	19.20

**Table 13**

**Short Circuit Current for Aluminum Conductors - XLPE  
Insulated (KA) at (90/250)°C**

Area (mm <sup>2</sup> )	Time (s)									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
16	4.78	3.38	2.76	2.39	2.14	1.51	1.07	0.87	0.76	0.68
25	7.47	5.28	4.31	3.73	3.34	2.36	1.67	1.36	1.18	1.06
35	10.46	7.40	6.04	5.23	4.68	3.31	2.34	1.91	1.65	1.48
50	14.94	10.56	8.63	7.47	6.68	4.72	3.34	2.73	2.36	2.11
70	20.91	14.79	12.08	10.46	9.35	6.61	4.68	3.82	3.31	2.96
95	28.38	20.07	16.39	14.19	12.69	8.98	6.35	5.18	4.49	4.01
120	35.85	25.35	20.70	17.93	16.03	11.34	8.02	6.55	5.67	5.07
150	44.82	31.69	25.88	22.41	20.04	14.17	10.02	8.18	7.09	6.34
185	55.28	39.09	31.91	27.64	24.72	17.48	12.36	10.09	8.74	7.82
240	71.71	50.71	41.40	35.85	32.07	22.68	16.03	13.09	11.34	10.14
300	89.64	63.38	51.75	44.82	40.09	28.35	20.04	16.37	14.17	12.68

**Table 14**

**Short Circuit Current for Copper Conductors - PVC Insulated (Type 5), as per Table 1 of BS 6746 (KA) at (85/160)°C**

Area (mm <sup>2</sup> )	Time (s)									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
16	5.25	3.71	3.03	2.63	2.35	1.66	1.17	0.96	0.83	0.74
25	8.20	5.80	4.74	4.10	3.67	2.59	1.83	1.50	1.30	1.16
35	11.49	8.12	6.63	5.74	5.14	3.63	2.57	2.10	1.82	1.62
50	16.41	11.60	9.47	8.20	7.34	5.19	3.67	3.00	2.59	2.32
70	22.97	16.24	13.26	11.49	10.27	7.26	5.14	4.19	3.63	3.25
95	31.18	22.05	18.00	15.59	13.94	9.86	6.97	5.69	4.93	4.41
120	39.38	27.85	22.74	19.69	17.61	12.45	8.81	7.19	6.23	5.57
150	49.23	34.81	28.42	24.61	22.01	15.57	11.01	8.99	7.78	6.96
185	60.71	42.93	35.05	30.36	27.15	19.20	13.58	11.08	9.60	8.59
240	78.76	55.69	45.47	39.38	35.22	24.91	17.61	14.38	12.45	11.14
300	98.45	69.62	56.84	49.23	44.03	31.13	22.01	17.97	15.57	13.92

**Table 15**

**Short Circuit Current for Aluminum Conductors - PVC Insulated (Type 5) as per table 1 of BS 6746 (KA) at (85/160)°C**

Area (mm <sup>2</sup> )	Time (s)									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
16	3.47	2.45	2.00	1.74	1.55	1.10	0.78	0.63	0.55	0.49
25	5.42	3.83	3.13	2.71	2.43	1.71	1.21	0.99	0.86	0.77
35	7.59	5.37	4.38	3.80	3.40	2.40	1.70	1.39	1.20	1.07
50	10.85	7.67	6.26	5.42	4.85	3.43	2.43	1.98	1.71	1.53
70	15.18	10.74	8.77	7.59	6.79	4.80	3.40	2.77	2.40	2.15
95	20.61	14.57	11.90	10.30	9.22	6.52	4.61	3.76	3.26	2.91
120	26.03	18.41	15.03	13.01	11.64	8.23	5.82	4.75	4.12	3.68
150	32.54	23.01	18.79	16.27	14.55	10.29	7.28	5.94	5.14	4.60
185	40.13	28.38	23.17	20.06	17.95	12.69	8.97	7.33	6.34	5.68
240	52.06	36.81	30.06	26.03	23.28	16.46	11.64	9.50	8.23	7.36
300	65.07	46.01	37.57	32.54	29.10	20.58	14.55	11.88	10.29	9.20



**Table 16**

**0.6/1 KV Cables Single Core Unarmoured Cables, With Stranded Circular Copper Conductor, XLPE Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
4	4.61	5.878	10.22
6	3.08	3.927	6.894
10	1.83	2.333	4.170
16	1.15	1.466	2.687
25	0.727	0.927	1.766
35	0.524	0.668	1.321
50	0.387	0.493	1.025
70	0.268	0.342	0.765
95	0.193	0.247	0.272
120	0.153	0.196	0.510
150	0.124	0.159	0.447
185	0.0991	0.127	0.393
240	0.0754	0.098	0.342
300	0.0601	0.078	0.310
400	0.0470	0.062	0.278
500	0.0366	0.050	0.256
630	0.0283	0.040	0.237
			0.173

**Table 17**

**0.6/1 KV Cable Single Core Unarmoured Cables, With Stranded Circular Aluminum Conductor, XLPE Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
16	1.91	2.449	4.361
25	1.20	1.538	0.808
35	0.868	1.113	2.079
50	0.641	0.822	1.590
70	0.443	0.568	1.154
95	0.320	0.410	0.884
120	0.253	0.324	0.734
150	0.206	0.264	0.632
185	0.164	0.211	0.540
240	0.125	0.161	0.452
300	0.100	0.129	0.398
400	0.0778	0.101	0.349
500	0.0605	0.079	0.311
630	0.0469	0.062	0.280
			0.213

The Above data are based on :

- Max. operating temperature : 90 °C
- Power factor : 0.85
- Rated frequency : 60 Hz
- Distance between cable in flat formation : One cable diameter

**Table 18**

**(0.6/1 KV Cable) Single Core Unarmoured Cables, With Stranded Circular Copper Conductor, PVC Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
4	4.61	5.787	10.07
6	3.08	3.866	6.794
10	1.83	2.297	4.115
16	1.15	1.433	2.654
25	0.727	0.913	1.746
35	0.524	0.658	1.307
50	0.387	0.486	1.018
70	0.268	0.337	0.758
95	0.193	0.243	0.597
120	0.153	0.193	0.509
150	0.124	0.156	0.446
185	0.0991	0.125	0.393
240	0.0754	0.096	0.341
300	0.0601	0.077	0.308
400	0.0470	0.062	0.280
500	0.0366	0.049	0.257
630	0.0283	0.039	0.237
			0.173

**Table 19**

**(0.6/1 KV Cable) Single Core Unarmoured Cables, With Stranded Circular Aluminum Conductor, PVC Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
16	1.91	2.410	4.297
25	1.20	1.514	2.695
35	0.868	1.095	2.051
50	0.641	0.809	1.567
70	0.443	0.559	1.137
95	0.320	0.404	0.872
120	0.253	0.319	0.659
150	0.206	0.260	0.623
185	0.164	0.207	0.532
240	0.125	0.158	0.447
300	0.100	0.127	0.393
400	0.0778	0.099	0.344
500	0.0605	0.078	0.307
630	0.0469	0.062	0.275
			0.208

The Above data are based on :

- Max. operating temperature : 90 °C
- Power factor : 0.85
- Rated frequency : 60 Hz
- Distance between cable in flat formation : One cable diameter

**Table 20**

**(0.6/1 KV Cable) Multicore Cables, With Stranded Copper Conductor,  
XLPE Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
1.5	12.1	15.428	22.82
2.5	7.41	9.448	14.01
4.0	4.61	5.878	8.747
6.0	3.08	3.927	5.871
10	1.83	2.333	3.519
16	1.15	1.446	2.239
25	0.727	0.927	1.446
35	0.524	0.669	1.063
50	0.387	0.494	0.809
70	0.268	0.343	0.585
95	0.193	0.248	0.444
120	0.153	0.197	0.368
150	0.124	0.161	0.315
185	0.0991	0.130	0.270
240	0.0754	0.101	0.226
300	0.0601	0.083	0.198
400	0.0470	0.067	0.176
500	0.0366	0.056	0.158

**Table 21**

**(0.6/1 KV Cables) Multicore Cables With Stranded Aluminum Conductor,  
XLPE Insulated and PVC Sheathed**

Cross Section Area (mm <sup>2</sup> )	D.C. Resistance (Ω/km)	A.C. Resistance (Ω/km)	Voltage Drop (mV/Amp/meter)
16	1.91	2.449	3.686
25	1.20	1.538	2.347
35	0.868	1.113	1.717
50	0.641	0.822	1.292
70	0.443	0.568	0.918
95	0.320	0.411	0.684
120	0.253	0.326	0.557
150	0.206	0.266	0.469
185	0.164	0.212	0.391
240	0.125	0.163	0.317
300	0.100	0.132	0.271
400	0.0778	0.104	0.230
500	0.0605	0.083	0.199

The Above data are based on :

- Max. operating temperature : 90 °C
- Power factor : 0.85
- Rated frequency : 60 Hz











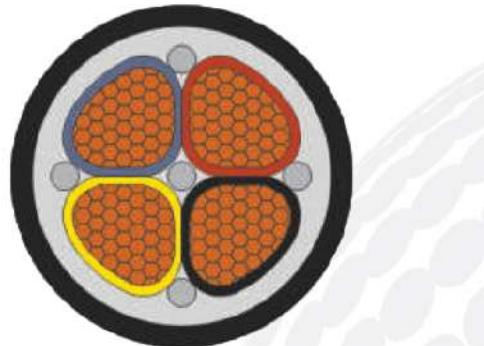




## Multicore cable

For outdoor indoor installation in drmp and wet location

Type	:	CU/XLPE/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	0.6/1 KV
Conductor	:	Soft annealed stranded copper wires
insulation	:	EXPE compound (or PVC)
Bedding	:	PVC compound (or LSHF or PE)
jacketing	:	PVC compound (or LSHF or PE)



## Technical Information

Nominal Cross Section	Nominal Insulation Thickness	Nominal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC resistance at 20°C	Current Rating		
						Lead Direct in Ground	Lead in Ducts	Lead in Free Air
nxmm <sup>2</sup>	mm	mm	mm	mm	Ω/km	A	A	A
3*50+25	1.0/0.9	1.8	26.5	1850	0.387/0.727	211	170	199
3*70+35	1.1/0.9	1.9	30.5	2560	0.268/0.524	251	211	240
3*95+50	1.1/1.0	2.1	34.0	3460	0.193/0.387	302	246	298
3*120+70	1.2/1.1	2.2	38.0	4390	0.153/0.268	348	287	345
3*150+70	1.4/1.1	2.3	41.5	5290	0.124/0.268	382	322	392
3*185+95	1.6/1.1	2.5	46.5	6650	0.0991/0.193	428	363	450
3*240+120	1.7/1.2	2.7	52.0	8610	0.0754/0.153	496	427	538
3*300+150	1.8/1.4	2.9	57.0	10730	0.0601/0.124	559	474	626
3*400+185	2.0/1.6	3.1	65.5	13650	0.0470/0.0991	638	544	720
3*500+240	2.0/1.7	3.34	72.5	17130	0.03700/0.0430	718	620	819
4*50	1.0	1.8	27.5	2010	0.387	211	170	199
4*70	1.1	2.0	31.3	2860	0.268	251	211	240
4*95	1.1	2.1	34.8	3890	0.193	302	246	298
4*120	1.2	2.3	40.0	4910	0.153	358	287	345
4*150	1.4	2.4	43.6	5060	0.124	382	322	392
4*185	1.6	2.5	48.6	7500	0.0991	428	363	440
4*240	1.7	2.8	54.5	9790	0.0754	496	427	538
4*300	1.8	3.0	61.0	12200	0.0601	559	474	626
4*400	2.0	3.3	70.0	15560	0.0470	638	544	720
4*500	2.2	3.5	77.5	19430	0.0366	718	620	819

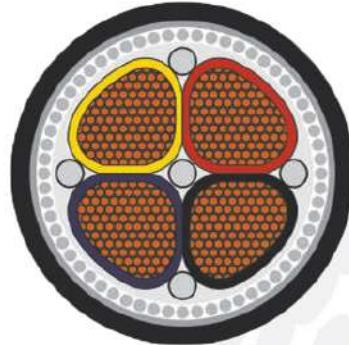




## Multicore cable

For outdoor installation in dry and wet location for street lighting

Type	:	AL/XLPE/SWA/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	0.6/1 KV
Conductor	:	Drawn Aluminum Wires
Insulation	:	EXPE compound (or PVC or LSHF)
Bedding	:	PVC compound (or LSHF or PE)
Jacketing	:	PVC compound (or LSHF or PE)



### Technical Information

Nominal Cross Section	Nominal Insulation Thickness	Nominal Diameter of S. Wire	Nominal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC resistance at 20°C	Current Rating		
							Lead Direct in Ground	Lead in Ducts	Lead in Free Air
nxmm <sup>2</sup>	mm	mm	mm	mm	Kg/km	Ω/km	A	A	A
3*50+25	1.0/0.9	1.60	1.9	31.5	2800	0.387/0.727	211	170	205
3*70+35	1.4/0.9	2.00	2.1	36.5	3950	0.268/0.524	251	211	246
3*95+50	1.1/1.0	2.00	2.2	40.0	5010	0.193/0.387	302	246	304
3*120+70	1.2/1.1	2.00	2.3	44.0	6110	0.153/0.268	348	287	351
3*150+70	1.4/1.1	2.50	2.5	49.5	7690	0.124/0.268	382	322	398
3*185+95	1.6/1.1	2.50	2.7	54.6	9260	0.0991/0.193	428	363	256
3*240+120	1.7/1.2	2.50	2.9	60.5	11600	0.0754/0.153	496	427	544
3*300+150	1.8/1.4	2.50	3.0	65.3	13950	01.0601/0.124	559	474	632
3*400+185	2.0/1.6	3.15	3.4	75.1	18360	0.0470/0.0991	638	544	725
37500+240	2.0/1.7	3.15	3.6	82.5	22160	0.0366/0.0754	718	620	825
4*50	1.0	1.60	2.0	32.5	3030	0.38700,4430	211	170	205
4*70	1.4	2.00	2.2	38.0	4310	0.3200	251	211	246
4*95	1.1	2.00	2.3	41.8	5530	0.2680	302	246	304
4*120	1.2	2.50	2.5	47.0	7100	0.1930	348	287	351
4*150	1.4	2.50	2.6	52.0	8560	0.1530	382	322	398
4*4185	1.6	2.50	2.8	57.0	10260	0.1240	428	363	456
4*240	1.7	2.50	3.0	64.0	12950	0.0991	496	427	544
4*300	1.8	2.50	3.2	69.0	15680	0.0754	559	474	632
4*400	2.0	3.15	3.5	80.5	20640	0.0601	638	544	725
4*500	2.2	3.15	3.8	88.5	25125	0.0366	718	620	825

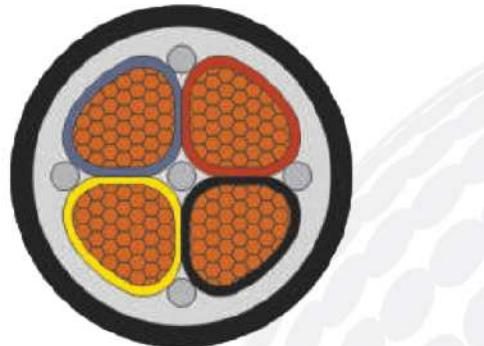




## Multicore cable

For outdoor indoor installation in drmp and wet location

Type	:	AL/XLPE/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	0.6/1 KV
Conductor	:	Drawn Amuminum Wires
insulation	:	EXPE compound (or PVC or LSHF)
Bedding	:	PVC compound (or LSHF or PE)
Armouring	:	Steel Wires
jacketing	:	PVC compound (or LSHF or PE)



### Technical Information

Nominal Cross Section	Nominal Insulation Thickness	Nominal Sheath Thickness	Approx. Overall Diameter	Approx. Cable Weight	Max DC resistance at 20°C	Current Rating		
						Lead Direct in Ground	Lead in Ducts	Lead in Free Air
nxmm <sup>2</sup>	mm	mm	mm	mm	Ω/km	A	A	A
3*50+25	1.0/0.9	1.8	26.0	800	0.641/1.20	165	129	152
3*70+35	1.1/0.9	1.9	29.5	1110	0.443/0.868	200	164	187
3*95+50	1.1/1.0	2.1	33.4	1420	0.320/0.641	239	193	228
3*120+70	1.2/1.1	2.2	37.8	1800	0.253/0.443	268	222	263
3*150+70	1.4/1.1	2.3	42.0	2310	0.206/0.443	302	202	310
3*185+95	1.6/1.1	2.5	46.5	2670	0.164/0.320	331	281	351
3*240+120	1.7/1.2	2.7	51.5	3410	0.125/0.253	388	328	421
3*300+150	1.8/1.4	2.9	57.0	4180	0.100/0.206	445	369	497
3*400+185	2.0/1.6	3.1	64.6	5300	0.0778/0.164	513	433	573
3*500+240	2.0/1.7	3.34	71.8	7220	0.0603/0.125	581	497	655
4*50	1.0	1.8	27.5	860	0.6410	165	129	152
4*70	1.1	2.0	31.5	1110	0.4430	200	164	187
4*95	1.1	2.1	34.6	1560	0.3200	239	193	228
4*120	1.2	2.3	39.5	2030	0.2530	268	222	263
4*150	1.4	2.4	43.5	2480	0.2060	302	202	310
4*185	1.6	2.5	49.0	2960	0.1640	331	281	351
4*240	1.7	2.8	55.0	3830	0.1250	388	328	421
4*300	1.8	3.0	61.0	4690	0.1000	445	369	497
4*400	2.0	3.3	73.0	6280	0.0778	513	433	573
4*500	2.2	3.5	77.0	7620	0.0605	531	497	655



**Tirupati Plastomatics Pvt. Ltd.**

## Two Core

For outdoor and indoor installation in dry and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Nominal Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Packing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Extruded Bedding	Diameter of Armour Wire	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	mm	mm	kg/km	meter ±5%
1.5*	12.1	0.7	0.8	0.9	1.3	12.7	300	1000
1.5	12.1	0.7	0.8	0.9	1.4	13.0	315	1000
2.5*	7.41	0.8	0.8	0.9	1.4	14.7	370	1000
2.5	7.41	0.8	0.8	0.9	1.4	14.8	395	1000
4	4.61	0.8	0.8	0.9	1.4	15.5	455	1000
6	3.08	0.8	0.8	0.9	1.5	17.0	550	1000
10	1.83	1.0	0.8	1.25	1.6	20.0	740	1000
16	1.15	1.0	0.8	1.25	1.6	22.5	1040	1000
25**	0.727	1.2	1.0	1.6	1.7	27.0	1620	500
35**	0.524	1.2	1.0	1.6	1.8	29.4	1960	500
50**	0.387	1.4	1.0	1.6	1.9	32.8	2240	500
70**	0.268	1.4	1.0	1.6	1.9	36.0	2800	500
95**	0.193	1.6	1.2	2.0	2.1	42.5	3720	500
120**	0.153	1.6	1.2	2.0	2.2	45.5	4590	500
150**	0.124	1.8	1.2	2.0	2.3	50.0	5420	500
185**	0.0991	2.0	1.4	2.5	2.4	55.0	6910	250
240**	0.0754	2.2	1.4	2.5	2.5	61.5	8440	250
300**	0.0601	2.4	1.6	2.5	2.7	66.5	10150	250
400**	0.0470	2.6	1.6	3.15	2.9	73.5	12520	250

\* Circular solid conductor (Class 1)

All Conductors Circular stranded or circular stranded compacted (Class 2)

\*\* Cables with sector shaped conductor having lesser overall dimension, Weight & cost are available on request



Tirupati Plastomatics Pvt. Ltd.

## Two Core

For outdoor and indoor installation in dry and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Extruded Bedding	Diameter of Armour Wire	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	mm	mm	kg/km	meter ±5%
16	1.81	1.0	1.0	1.25	1.8	23.0	910	1000
25	1.20	1.2	1.0	1.6	1.8	27.2	1320	500
35	0.868	1.2	1.0	1.6	1.8	29.5	1550	500
50	0.641	1.4	1.0	1.6	1.9	33.0	1670	500
70	0.443	1.4	1.2	2.0	2.0	37.8	2310	500
95	0.320	1.6	1.2	2.0	2.2	42.5	2800	500
120	0.253	1.6	1.2	2.0	2.3	45.8	3155	500
150	0.206	1.8	1.4	2.5	2.4	51.0	4070	500
185	0.164	2.0	1.4	2.5	2.6	55.5	4700	250
240	0.125	2.2	1.6	2.5	2.8	62.2	5720	250
300	0.100	2.4	1.6	2.5	2.9	67.3	6710	250
400	0.0778	2.6	1.6	2.5	3.2	74.5	7810	250
500	0.0366	2.8	1.8	3.15	3.4	84.0	10160	200

All Conductors Circular stranded or circular stranded compacted (Class 2)



Tirupati Plastomatics Pvt. Ltd.

## Three Core

For outdoor and indoor installation in dry and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
Insulation	:	PVC compound Type 5 HR 85°C
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area of Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	kg/km	meter ±5%
1.5*	12.1	0.7	1.8	5.2	170	1000
1.5	12.1	0.7	1.8	11.6	180	1000
2.5*	7.41	0.8	1.8	12.2	220	1000
2.5	7.41	0.8	1.8	12.5	230	1000
4	4.61	0.8	1.8	14.0	305	1000
6	3.08	0.8	1.8	16.5	385	1000
10	1.83	1.0	1.8	17.8	565	1000
16	1.15	1.0	1.8	20.0	780	1000
25	0.727	1.2	1.8	21.5	1055	500
35	0.524	1.2	1.8	23.5	1365	500
50	0.387	1.4	1.8	27.4	1760	500
70	0.268	1.4	2.0	29.8	2390	500
95	0.193	1.6	2.1	34.8	3245	500
120	0.153	1.6	2.2	37.9	3980	500
150	0.124	1.8	2.3	40.6	4910	500
185	0.0991	2.0	2.5	45.5	6050	250
240	0.0754	2.2	2.6	51.5	7750	250
300	0.0601	2.4	2.8	56.7	9670	250
400	0.0470	2.6	3.1	64.0	12420	250
500	0.0366	2.8	3.4	69.5	15490	250

\* Circular solid conductor (Class 1)

Conductor including 16sqmm. and above shaped stranded conductor (Class 2)

Cables upto and including 6sqmm. generally to BS 6346 and 60502-1

Cables upto and including 400sqmm conform generally to BS 6346

500sqmm cable conform to IEC 60502-2



**Tirupati Plastomatics Pvt. Ltd.**

## Four Core

For outdoor and indoor installation in dry and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Extruded Bedding	Diameter of Armour Wire	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	mm	mm	kg/km	meter ±5%
1.5*	12.1	0.7	0.8	0.9	1.4	13.4	340	1000
1.5	12.1	0.7	0.8	0.9	1.4	13.8	360	1000
2.5*	7.41	0.8	0.8	0.9	1.4	14.7	410	1000
2.5	7.41	0.8	0.8	0.9	1.4	15.0	430	1000
4	4.61	0.8	0.8	0.9	1.4	16.4	520	1000
6	3.08	0.8	0.8	1.25	1.5	18.5	720	1000
10	1.83	1.0	0.8	1.25	1.6	21.2	970	1000
16	1.15	1.0	1.0	1.25	1.6	23.4	1250	1000
25	0.727	1.2	1.0	1.6	1.7	25.8	1670	500
35	0.524	1.2	1.0	1.6	1.8	28.3	2060	500
50	0.387	1.4	1.2	1.6	1.9	32.0	2620	500
70	0.268	1.4	1.2	2.0	2.0	35.5	3580	500
95	0.193	1.6	1.2	2.0	2.1	40.5	4590	500
120	0.153	1.6	1.4	2.0	2.2	43.7	8490	500
150	0.124	1.8	1.4	2.5	2.4	48.0	6950	500
185	0.0991	2.0	1.6	2.5	2.5	52.5	8280	250
240	0.0754	2.2	1.6	2.5	2.6	60.0	10350	250
300	0.0601	2.4	1.6	2.5	2.8	63.8	12490	250
400	0.0470	2.6	1.6	2.5	3.0	72.0	15570	200
500	0.0366	2.8	1.8	3.15	3.9	79.0	19920	200

\* Circular solid conductor (Class 1)

Conductor including 16sqmm. and above shaped stranded conductor (Class 2)

Cables upto and including 6sqmm. generally to BS 6346 and 60502-1

Cables upto and including 400sqmm conform generally to BS 6346

500sqmm cable conform to IEC 60502-2



Tirupati Plastomatics Pvt. Ltd.

## Four Core with reduced Neutral

For outdoor and indoor installation in drmp and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Nominal Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
Insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



### Technical Information

Nominal Area of Conductor		Maximum Conductor Resistance at 20°C		Thickness of Insulation		Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Approx. Cable Weight	Approx. Cable Weight	Standard Packing Length
Phase	Neutral	Phase	Neutral	Phase	Neutral	mm	mm	kg/km	kg/km	kg/km	meter +5%
sqmm	sqmm	Ω/km	Ω/km	mm	mm	mm	mm	kg/km	kg/km	kg/km	meter +5%
10	6	1.83	3.08	1.0	1.0	1.0	1.25	1.8	23.0	1085	1000
16	10	1.15	1.83	1.0	1.0	1.0	1.6	1.8	26.1	1530	500
25	16	0.727	1.15	1.2	1.0	1.0	1.6	1.8	28.0	1940	500
35	16	0.524	1.15	1.2	1.0	1.0	1.6	1.8	31.5	2360	500
50	25	0.387	0.727	1.4	1.2	1.0	1.6	1.9	35.0	3030	500
70	35	0.268	0.524	1.4	1.2	1.2	2.0	2.0	39.5	4140	500
95	50	0.193	0.387	1.6	1.4	1.2	2.0	2.2	45.0	5350	500
120	70	0.153	0.268	1.6	1.4	1.4	2.5	2.3	49.0	6870	500
150	70	0.124	0.268	1.8	1.4	1.4	2.5	2.4	54.0	8090	500
185	95	0.0991	0.193	2.0	1.6	1.4	2.5	2.5	59.0	9710	250
240	120	0.0754	0.153	2.2	1.6	1.6	2.5	2.7	65.0	11980	250
300	150	0.0601	0.124	2.4	1.8	1.6	2.5	2.9	71.0	14630	250
400	185	0.0470	0.0991	2.6	2.0	1.8	3.15	3.1	80.0	18980	200

All Conductor upto 16sqmm. and above shaped stranded conductor (Class 2)

Cables Confirm to IEC 60502-1



Tirupati Plastomatics Pvt. Ltd.

## Four Core

For outdoor and indoor installation in drmp and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area of Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	kg/km	meter +5%
1.5*	12.1	0.7	1.8	12.0	205	1000
1.5	12.1	0.7	1.8	12.5	215	1000
2.5*	7.41	0.8	1.8	13.5	260	1000
4	7.41	0.8	1.8	14.0	280	1000
6	4.61	0.8	1.8	15.0	365	1000
10	3.08	0.8	1.8	16.5	460	1000
16	1.83	1.0	1.8	19.5	690	1000
16	1.15	1.0	1.8	22.0	980	500
25	0.727	1.2	1.8	23.5	1290	500
35	0.524	1.2	1.8	27.0	1710	500
50	0.387	1.4	1.9	30.5	2300	500
70	0.268	1.4	2.0	33.5	3420	500
95	0.193	1.6	2.2	39.0	4272	500
120	0.153	1.6	2.3	42.0	5250	500
150	0.124	1.8	2.5	46.5	6500	500
185	0.0991	2.0	2.6	51.0	7990	250
240	0.0754	2.2	2.8	56.5	10240	250
300	0.0601	2.4	3.1	63.0	12820	250
400	0.0470	2.6	3.3	71.0	16380	200
500	0.0366	2.8	3.6	79.0	20510	200

\* Circular solid conductor (Class 1)

Conductor including 16sqmm. and above shaped stranded conductor (Class 2)

Cables upto and including 6sqmm. generally to BS 6346 and 60502-1

Cables upto and including 400sqmm conform generally to BS 6346

500sqmm cable conform to IEC 60502-2



Tirupati Plastomatics Pvt. Ltd.

## Four Core

For outdoor and indoor installation in dry and wet location

Type	:	CU/PVC/PVC/SWA/PVC
Standard	:	BS 6346 and IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Plain annealed copper wires
Insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



## Technical Information

Nominal Area Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Extruded Bedding	Diameter of Armour Wire	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	mm	mm	kg/km	meter +5%
1.5*	12.1	0.7	0.8	0.9	1.4	14.6	380	1000
1.6	12.1	0.7	0.8	0.9	1:4	14:5	400	7000
2.5*	7.41	0.8	0.8	0.9	1.4	15.5	470	1000
4	7.41	0.8	0.8	0.9	1:4	16:5	490	1000
6	461	0.8	0.8	1.25	15	16.5	710	1000
10	3:08	0.8	0.8	1.28	1.5	20.0	830	1000
16	1.83	1.0	0.8	1.25	1.6	22.5	1135	1000
16	1.15	1.0	1.0	16	17	26:5	1655	500
25	0.727	1.2	1.0	16	1.8	28.0	2045	500
35	0.524	1.2	1.6	16	1.9	31.2	2560	500
50	0.387	1.4	1.2	2.0	20	36.5	3520	500
70	0.268	1.4	1.2	2.0	2.1	39.5	4460	500
45	0.193	1.5	1.2	2.0	2.2	445	5770	500
120	0.153	1.6	1.4	25	24	50:0	7360	500
150	0.124	1.8	1.4	25	2.5	53.5	8770	250
185	0.0991	2.0	1.4	2.5	29	59.0	10540	260
240	0.0754	2.2	1.6	25	2.8	65.0	13060	250
300	0.0601	2.4	4.6	2.5	3.0	70.5	15890	250
400	0.0470	2.6	1.8	3.15	3.3	80.0	10730	200
500	0.0366.	2.8	1.6	3.15	3.9	89.0	25420	200

\* Circular solid conductor (Class 1)

Conductor including 16sqmm. and above shaped stranded conductor (Class 2)

Cables upto and including 6sqmm. generally to BS 6346 and 60502-1

Cables upto and including 400sqmm conform generally to BS 6346

500sqmm cable conform to IEC 60502-2



Tirupati Plastomatics Pvt. Ltd.

## Multicore cable for street lighting

For outdoor installation in drmp and wet location for street lighting

Type	:	AL/PVC/PVC/SWA/PVC
Standard	:	IEC 60502-1
Rated Voltage	:	600/1000 volt
Conductor	:	Amuminum Wires
insulation	:	PVC compound Type 5 HR 85°C
Armouring	:	Steel rounded Wire
Sheathing	:	PVC compound Type 9
Backing	:	Not Returnable wood drums as per customer requirement



### Technical Information

Nominal Area Conductor	Maximum Conductor Resistance at 20°C	Thickness of Insulation	Thickness of Extruded Bedding	Diameter of Armour Wire	Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Standard Packing Length
sqmm	Ω/km	mm	mm	mm	mm	mm	kg/km	meter +5%
25	1.20	1.2	1.0	1.6	1.8	28.0	1425	500
35	0.868	1.2	1.0	1.6	1.9	31.5	1720	500
50	0.641	1.4	1.2	2.0	2.1	37.0	2400	500
70	0.443	1.4	1.2	2.0	2.2	40.0	2840	500
95	0.320	1.6	1.2	2.5	2.4	45.5	3920	500
120	0.253	1.6	1.4	2.5	2.5	50.0	4450	500
150	0.206	1.8	1.4	2.5	2.7	52.5	5060	500
185	0.164	2.0	1.6	2.5	2.9	59.5	6090	500
240	0.125	2.2	1.6	2.5	3.1	65.5	7320	250
300	0.100.	24	1.6	2.5	3.3	70.6	8610	250
400	0.0778	2.6	1.8	3.15	3.6	80.0	11190	200
500	0.0605	2.8	1.8	3.15	3.9	89.0	13710	200

All the conductor shaped stranded (Class 2)









Tirupati Plastomatics Pvt. Ltd.

## Multicore cable for street lighting

For outdoor installation in dry and wet location for street lighting

Type	:	CU/PVC/PVC
Standard	:	IEC 60502-1
Nominal Voltage	:	600/1000 Volt
Conductor	:	Soft annealed stranded copper wires
insulation	:	PVC compound Type 5 (HR 85°C)
jacketing	:	PVC compound Type 9 (HR 90°C)
Packing	:	Plastic supercold or non returnable wood drums as per customer requirements



### Technical Information

Cable Details	Nominal Area of Conductor		Maximum Conductor Resistance at 20°C		Thickness of Insulation		Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Cable Weight	Approx. Gross Weight
	Phase	Neutral &Earth	Phase	Neutral &Earth	Phase	Neutral &Earth				
Sqmm			Ω/km		mm		mm	mm	Kg/km	Kg
2x16+1x10	16	10	1.15	1.83	1.0	1.0	1.8	20.0	740	835
3x25+2x16	25	16	0.727	1.15	1.2	1.0	1.8	28.5	1620	930 (for 500 m.)
3x35+2x16	35	16	0.524	1.15	1.2	1.0	1.9	32.5	2075	1200 (for 500 m.)



## Technical Data

### Unarmoured Cables

Single pair & multi pairs, PE Insulated, Individual & Overall Screened, PVC Outer Sheath



**Table 1**

Nominal dimensions of 0.5 mm <sup>2</sup> Class 1 (Solid) Conductor (1/0.8 mm) multipair polyethylene insulated cables									
Number of Pairs	No.	1	2	5	10	15	20	30	50
Thickness of outer sheath	mm	0.8	0.8	1.1	1.2	1.2	1.3	1.3	1.5
Naminal overall diameter	mm	5.3	6.1	10.6	14.1	16.3	18.4	22.2	28.1

**Table 2**

Nominal dimensions of 1 mm <sup>2</sup> Class 1 (Solid) Conductor (1/1.13 mm) multipair polyethylene insulated cables									
Number of Pairs	No.	1	2	5	10	15	20	30	50
Thickness of outer sheath	mm	0.8	0.8	1.2	1.2	1.3	1.5	2	2.2
Naminal overall diameter	mm	6.5	7.4	13.2	13.2	20.3	23.4	34.4	44.1

**Table 3**

Nominal dimensions of 0.5 mm <sup>2</sup> Class 1 (Solid) Conductor (7/0.53 mm) multipair polyethylene insulated cables									
Number of Pairs	No.	1	2	5	10	15	20	30	50
Thickness of outer sheath	mm	0.8	0.9	1.2	1.3	1.5	1.5	1.7	2.0
Naminal overall diameter	mm	7.4	8.7	15.5	20.6	24.2	27.5	33.5	42.8



## Technical Data

### Armoured Cables

Single pair & multi pairs, PE Insulated, Individual & Overall Screened, Armoured, PVC Outer Sheath



**Table 4**

Nominal dimensions of 0.5 mm <sup>2</sup> Class 1 (Solid) Conductor (1/0.8 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	2	5	10	15	20	30	50
Thickness of outer sheath	mm	0.9	1.2	1.2	1.3	1.3	1.5	2
Naminal overall diameter	mm	9.4	12.5	17.3	20.3	22.5	26.9	35.5

**Table 5**

Nominal dimensions of 1 mm <sup>2</sup> Class 1 (Solid) Conductor (1/1.13 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	2	5	10	15	20	30	50
Thickness of outer sheath	mm	1.1	1.2	1.3	1.5	1.7	2	2.2
Naminal overall diameter	mm	11.8	15.4	26.6	25.0	28.8	34.4	44.1

**Table 6**

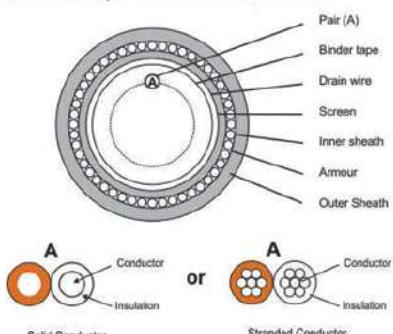
Nominal dimensions of 0.5 mm <sup>2</sup> Class 1 (Solid) Conductor (7/0.53 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	2	5	10	15	20	30	50
Thickness of outer sheath	mm	1.2	1.3	1.5	1.7	1.7	2	2.2
Naminal overall diameter	mm	13.6	17.8	25.5	30.0	33.4	40.1	51.5



## Technical Data

### Armoured Cables

Single pair & multi pairs, PE Insulated, Individual & Overall Screened, Armoured, PVC Outer Sheath



**Table 7**

Nominal dimensions of 0.5 mm <sup>2</sup> Class 1 (Solid) Conductor (1/0.8 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	1	2	5	10	20	30	50
Thickness of inner sheath/bedding	mm	0.8	0.8	1.1	1.2	1.3	1.3	1.5
Diameter over inner sheath bedding	mm	5.3	6.1	10.6	14	18.4	22	27.9
Size of armour wire	mm	0.9	0.9	0.9	1.25	1.6	1.6	1.6
Diameter over amour	mm	7.1	7.9	12.4	16.5	21.6	25.2	21.1
Thickness of outer sheath	mm	1.3	1.3	1.4	1.6	1.7	1.8	2
Naminal overall diameter	mm	9.8	10.4	15.2	19.6	25.2	28.8	35.3

**Table 8**

Nominal dimensions of 1.0 mm <sup>2</sup> Class 1 (Solid) Conductor (1/1.13 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	1	2	5	10	20	30	20
Thickness of inner sheath/bedding	mm	0.8	0.8	1.2	1.2	1.5	1.5	2.0
Diameter over inner sheath bedding	mm	6.4	7.4	13.2	17.4	23.4	28	36.3
Size of armour wire	mm	0.9	0.9	1.25	1.25	1.6	1.6	2
Diameter over amour	mm	8.2	9.2	15.7	19.9	26.6	21.2	40.3
Thickness of outer sheath	mm	1.3	1.4	1.5	1.7	1.8	2	2.2
Naminal overall diameter	mm	10.8	12.1	18.7	23.2	30.2	35.4	45.0

**Table 9**

Nominal dimensions of 1.5 mm <sup>2</sup> Class 1 (Stranded) Conductor (1/1.13 mm) multipair polyethylene insulated cables								
Number of Pairs	No.	1	2	5	10	20	30	50
Thickness of inner sheath/bedding	mm	0.8	0.9	1.2	1.3	1.5	1.7	2.0
Diameter over inner sheath bedding	mm	7.3	8.7	15.4	20.6	27.5	33.3	42.6
Size of armour wire	mm	0.9	0.9	1.25	1.6	1.6	2	2
Diameter over amour	mm	9.1	10.5	17.9	23.8	30.7	37.3	47.6
Thickness of outer sheath	mm	1.4	1.4	1.6	1.8	2	2.1	2.4
Naminal overall diameter	mm	12.1	13.3	21.0	27.4	41.6	41.6	52.8





## Pilot Cables

Tirupati Plastomatics can manufacture Pilot cables as per client specific requirements.

### Application:

Pilot cables associated with Power distribution and transmission system are used for control, protection, signaling, speech and data transmission purposes. Such systems are mainly operated by the electricity companies. Similar applications occur in many industrial systems also.

### Advantage:

- ° Customised to suit the application.
- ° Integrated Power system.
- ° Induced voltage control.
- ° Enhanced transmission performance.
- ° Multifunction use.

Pilot cables are designed to protect the cores from the danger of induced voltages coming from other cable circuits laid in close proximity.

It protects the system from dangerous induced voltages and EMC problems by means of different shielding types which are specifically designed to suit the operating conditions. The screen restricts the over voltage on the cable cores.

We manufacture a broad rage of pilot cables covering both 5 kV and 15 kV levels of induced voltages and providing each customer with numerous and easily customized alternatives.

### Cable Description:

- ° Conductor : Annealed plain copper conductor (solid/stranded)
- ° Insulation: PE or PVC.
- ° Cabling : Multipair or Multicore.
- ° screens : Aluminium laminate or Copper laminate or Copper tape
- ° Armouring : Galvanised steel wire armour.
- ° Beading / Outer Sheath: PE or PVC.





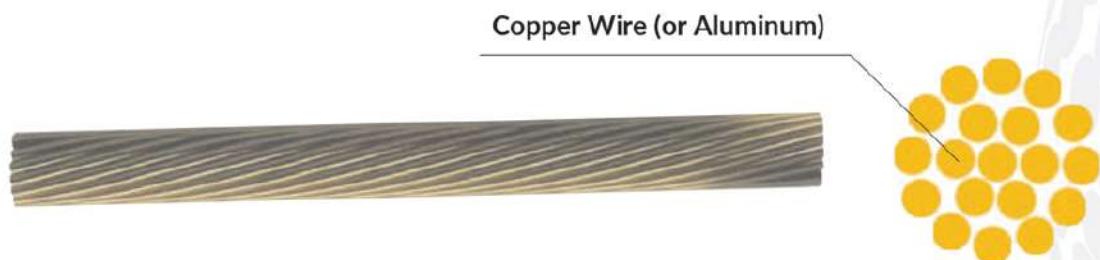
## Overhead Conductors

### Introduction

Overhead lines are bare conductors that are used for earthing electrical systems (when soft drawn copper is used) and in transmission/distribution of high voltage electricity (when hard drawn copper and aluminum is used). Examples include:

- . AAC (All Aluminum Conductors) used in short spans
- . AAAS (All-Aluminum -Aloy Conductors)
- . ACSR (Aluminum Conductor Steel Reinforced ) used in large spans
- . ACAR (Aluminum Conductor, Alloy Reinforced)

In this catalogue, we cover all technical aspects of Tirupati Plastomatics Pvt. Ltd. Overhead Lines. We included Design Considerations such as conductor size, number of wires, and wire diameter. Cables Electrical Parameters such as Conductor DC Resistance are included as well.



## GENERAL INFORMATION

### Standards

- The overhead lines described in this catalogue are all standard types, and their performance has been proved in operation.
- Construction and tests are all in accordance with recommendations of IEC, ASTM, DIN, and BS publications where applicable.
- Overhead lines in accordance to customer requirements and needs can be manufactured upon request.

### Variation in Production and delivery Options

- The provided data is approximate and subject to manufacturing tolerance
- Delivery length tolerance is +/- 5%
- Other overhead line sizes are available upon customer request

### Electrical Parameters of Overhead Lines

#### DC Resistance

- The DC resistance of soft annealed copper conductors is based on 100% conductivity at 20°C with a corresponding resistivity of 0.017241 ohm.mm'/m and a constant mass temperature coefficient at 20°C per Kelvin of 0.00393
- The DC resistance of hard drawn copper conductors is based on 97% conductivity at 20°C with a corresponding Resistivity of 0.01771 ohm.mm²/m and a constant mass temperature coefficient at 20°C per Kelvin of 0.00381
- The DC resistance of hard drawn aluminum conductors is based on volume resistivity of 0.028264 ohm.mm"/m and a constant mass temperature coefficient at 20°C per Kelvin of 0.00403°C



Tirupati Plastomatics Pvt. Ltd.

## BARE Copper Conductors

For transmission and distribution in electrical network

Standard	:	IEC 60228
Conductor	:	Soft annealed stranded Copper wires
Packing	:	Coils or Non returnable wooden drum as per customer requirements



### Technical Information



Nominal Cross Section	Number & nominal wire diameter	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C
mm <sup>2</sup>	NR x mm	mm	Kg/km	Ω/km
4	7x0.84	2.50	35	4.610
6	7x1.03	3.10	50	3.080
10	7x1.33	4.00	90	1.830
16	7x1.67	5.00	140	1.150
25	19x2.11	6.30	220	0.727
35	19x2.48	7.44	300	0.524
50	19x1.76	8.80	415	0.387
70	19x2.12	10.55	595	0.268
95	37x2.48	12.40	820	0.193
120	37x2.00	14.00	1060	0.153
150	37x2.22	15.60	1290	0.124
185	37x2.48	17.36	1600	0.0991
240	61x2.22	20.00	2130	0.0754
300	61x3.48	22.32	2645	0.0601
400	61x3.82	25.40	3455	0.0470
500	61x3.17	28.60	4365	0.0366



Tirupati Plastomatics Pvt. Ltd.

## BARE Copper Conductors

For transmission and distribution in electrical network

Standard : DIN 48201-Part-1  
Conductor : hard drawn stranded Copper wires  
Packing : Non returnable wooden drum as per customer requirements



### Technical Information

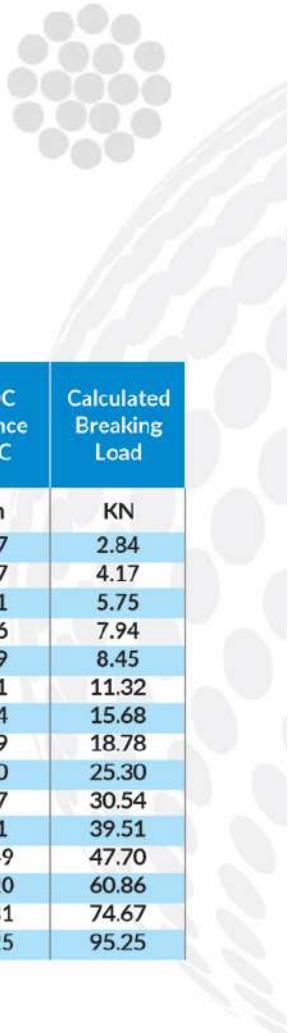
Nominal Cross Section	Number & nominal wire diameter	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C	Calculated Breaking Load
mm <sup>2</sup>	NR x mm	mm	Kg/km	Ω/km	KN
10	7x1.35	4.05	90	1.8060	4.1
16	7x1.70	5.1	145	1.1385	6.5
25	7x2.10	6.3	220	0.7461	9.9
35	7x2.50	7.5	310	0.5264	14.0
50	19x1.80	9.0	435	0.3759	19.8
70	19x2.10	10.5	595	0.2962	26.9
95	19x2.50	12.5	845	0.1949	38.1
120	19x2.80	14.0	1065	0.1554	47.8
150	37x2.25	15.7	1335	0.1238	60.1
185	37x2.50	17.5	1650	0.1003	74.2
240	61x2.25	20.2	2210	0.0753	99.0
300	61x2.50	22.5	2725	0.0610	122.3
400	61x2.89	26.0	3640	0.0456	163.4
500	61x3.23	29.1	4545	0.0365	204.2



## All Aluminum Conductors (AAC)

For transmission and distribution in electrical network with relatively short spans

Standard	:	DIN 48201-Part-5, BS 215
Conductor	:	hard drawn stranded aluminum wires
Packing	:	Non returnable wooden drum as per customer requirements



### Technical Information

According to DIN 48201

Nominal Cross Section	Number & nominal wire diameter N* d (mm)	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C	Calculated Breaking Load
mm <sup>2</sup>	NR x mm	mm	Kg/km	Ω/km	KN
16	7x1.70	5.1	45	1.8017	2.84
25	7x2.10	6.3	65	1.1807	4.17
35	7x2.50	7.5	95	0.8331	5.75
50	7x3.00	9.0	135	0.5786	7.94
50	19x1.80	9.0	135	0.5949	8.45
70	19x2.10	10.5	180	0.4371	11.32
95	19x2.50	12.5	255	0.3084	15.68
120	19x2.80	14.0	320	0.2459	18.78
150	37x2.25	15.7	405	0.1960	25.30
185	37x2.50	17.5	500	0.1587	30.54
240	61x2.25	20.2	670	0.1191	39.51
300	61x2.50	22.5	825	0.09649	47.70
400	61x2.89	26.0	1105	0.07220	60.86
500	61x3.23	29.1	1380	0.05781	74.67
630	91x2.96	32.6	1730	0.04625	95.25

According to BS 215

Code Name	Nominal Cross Section	Number & nominal wire diameter N* d (mm)	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C	Calculated Breaking Load
	mm <sup>2</sup>	NR x mm	mm	Kg/km	Ω/km	KN
MIDGE	22	7x2.6	6.18	64	1.227	3.99
ANT	50	7x3.10	9.30	145	0.5419	8.28
FLY	60	7x3.40	10.2	174	0.4505	9.90
WASP	100	7x4.39	13.17	290	0.2702	16.0
HORNET	150	19x3.25	16.25	434	0.1825	25.7
CHAFER	200	19x3.78	18.9	587	0.1349	32.4
COCKROACH	150	19x4.22	21.1	731	0.1083	40.0
BUTTERFLY	300	19x4.65	23.25	888	0.08916	28.75
CENTIPEDE	400	37x3.78	26.46	1145	0.06944	56.10





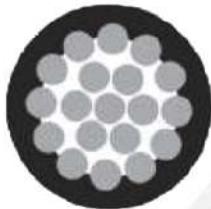


Tirupati Plastomatics Pvt. Ltd.

## PVC Insulated Hard Drawn Copper Conductors

For overhead power lines when crossing telecommunication Lines

Type	:	Type 8 (or Type 16)*
Standard	:	BS 6485
Conductor	:	Hard drawn stranded Copper wires
Insulation	:	PVC Compound**
Packing	:	Non-returnable wooden drums as per customer requirements



### Technical Information

#### Type 8

Nominal Cross Section	Number & nominal wire diameter	Minimum Insulation Thickness	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C
mm <sup>2</sup>	NR x mm	mm	mm	kg/km	Ω/km
10	7x1.35	0.8	6.1	117	1.890
16	7x1.70	0.8	7.1	185	1.190
25	7x2.14	0.8	8.4	266	0.749
35	7x2.50	0.8	9.6	360	0.540
50	7x3.10	0.8	11.0	505	0.399
50	19x1.80	0.8	11.1	510	0.399
70	19x2.10	0.8	12.6	566	0.276
95	19x2.50	0.8	14.6	950	0.199
120	19x2.50	0.8	16.2	1185	0.158
150	37x2.25	0.8	17.9	1465	0.128
185	37x2.50	0.8	19.7	1795	0.102



\*Insulation color is black for type 8, green for Type 16, or other colors as per customer requirements

\*\* Type 16 (increased insulation thickness) overhead lines are available.

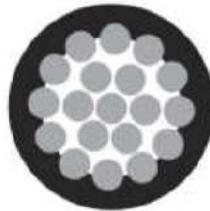


Tirupati Plastomatics Pvt. Ltd.

## PVC Insulated Hard Drawn Aluminum conductors

For overhead power lines when crossing telecommunication Lines

Type	:	Type 8 (or Type 16)*
Standard	:	BS 6485
Conductor	:	Hard drawn stranded Aluminum wires
Insulation	:	PVC Compound**
Packing	:	Non-returnable wooden drums as per customer requirements



### Technical Information



Nominal Cross Section	Number & nominal wire diameter	Minimum Insulation Thickness	Approx. Overall Diameter	Approx. Conductor Weight	Max DC Resistance at 20°C
mm <sup>2</sup>	NR x mm	mm	mm	kg/km	Ω/km
16	7x1.70	0.8	7.2	82	1.8017
25	7x2.10	0.8	8.4	118	4.1807
35	7x2.50	0.8	9.6	148	1.8331
50	7x3.10	0.8	11.4	200	0.5786
50	19x1.80	0.8	11.0	205	0.5949
70	19x2.10	0.8	12.5	250	0.4371
95	19x2.50	0.8	14.5	340	0.3084
120	19x2.80	0.8	16.0	410	0.2459
150	37x2.25	0.8	17.8	515	0.1960
185	37x2.50	0.8	19.6	600	0.1587

\*Insulation color is black for type 8, green for Type 16, or other colors as per customer requirements

\*\* Type 16 (increased insulation thickness) overhead lines are available.







## CERTIFICATES



### Type Approval Certificate

Type of Approval:	<b>RENEWAL</b>	Date of Issue:	<b>05-July-2010</b>
This certificate is issued in favour of			
<b>Tirupati Plastomatics Pvt. Ltd.</b>			
Office:	B-14/1A, Road No. 90, Vizhavakamma Industrial Area, Jaffna-302013.	Works:	B-14/1A, Road No. 90, Vizhavakamma Industrial Area, Jaffna-302013.
Phone:	(0141)-2300205, 2311000, 2300427	Fax:	(0141)-2300205, 2311030, 2300427
Email: support@plasticable.com Website: www.plasticable.com			
For manufacture and supply of			
Underground Railway Jelly Filled Quad Cables For Signaling And Telecom Installations			
Production Capacity:	1775 Kms	Status of Firm:	(Part-I or Part-II)
Period:	05 Years	Part-IV(ONE)	

Type of Approval:	<b>RENEWAL</b>	Date of Issue:	<b>14 October-2010</b>
This certificate is issued in favour of			
<b>Tirupati Plastomatics Pvt. Ltd.</b>			
Office:	B-14/1A, Road No. 90, Vizhavakamma Industrial Area, Jaffna-302013	Works:	B-14/1A, Road No. 90, Vizhavakamma Industrial Area, Jaffna-302013
Phone:	(0141)-2300205, 2311000, 2300427	Fax:	(0141)-2300205, 2311030, 2300427
Email: support@plasticable.com			
For manufacture and supply of			
Item: Single Core Cable PIC: Insulated Railway Signalling Indoor Single Core Cable			
Production Capacity:	2448 Kms	Status of Firm:	(Part-I or Part-II)
Period:	05 Years	Part-IV(ONE)	

This certificate is valid up to : <b>30-JUNE-2012</b>			
Note: 1.The terms and conditions overleaf shall be applicable. 2.The new material sources shall be as per approved DAP.			
1. This Type Approval is subject to continuing & continual monitoring.			
2. In case of deviation in design or any other specification from the approved product, Type Approval will be withdrawn and the manufacturer may apply for re-approval.			
3. Period validity of the approval: DDCP approves the right to inspect			
this product at any premises where it is produced or placed in the market.			
4.1. If any deviation in performance of the approved product is noticed during inspection, it may be withdrawn and the right to inspect the product will be withdrawn.			
4.2. In case of material, if supplied to the supplier, which contains non-compliance material, there shall be no compensation made to the manufacturer by the supplier. Non of the above can check the material in the field and expect it, if not found in conformity with the specification.			
The Director General DDCP, 31 December-2003 2. The new material sources shall be as per Approved DAP.			
<p style="text-align: center;"><i>(G. Gov)</i> <b>Director (DAP)</b> For Director General DDCP ADMNNO:00000000000000000000</p>			





# Tirupati Plastomatics Pvt. Ltd.

(Integrated Management System (IMS) Certified Company)

## Corporate Office

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Quality you can trust...



Brand Name:  
**Gemini Cables**

