

Winding Wires & 3 Core Flat PVC Cables



Finolex Cables Limited

Started in 1958, Finolex Cables Limited is India's largest and leading electrical and telecommunication cables manufacturer. Finolex Cables has always believed in enhancing capabilities and augmenting the product basket. In the last few years, besides the cables business the company has forayed into new segments and added new products under the Finolex brand. The company offers Total Electrical Solutions with products like electrical wires, 3 core flat cables, communication cables, telecommunication cables, flexible cables, auto cables, conduits, room heaters, LED lights, switches, switchgears, fans, irons and water heaters. Finolex Cables Limited has four manufacturing facilities viz. at Pimpri (Pune), Urse (near Pune), Verna (Goa) and Roorkee (Uttarakhand).

The company is known for their unmatched quality and safety standard which has made it amongst the most reliable brands of the country. Over the six-decade long journey, Finolex Cables has cemented its reputation as an innovative leader and quality manufacturer by continuously upgrading technology, modernizing manufacturing facilities and maintaining the highest standards in quality and service.

PVC INSULATED WINDING WIRES & 3 CORE FLAT CABLES FOR SUBMERSIBLE PUMP MOTORS

PVC INSULATED WINDING WIRES

Manufactured at state-of-the-art plant, Finolex Winding Wires are insulated with a superior grade of HR PVC compound formulated and manufactured in-house, to give it the necessary electrical strength and resistance to abrasion. Technical collaboration with world leaders. M/s. Norddeutsche Seekabel Werke (NSW) of Germany, further helped us upgrade our technology. The copper conductor of required purity and conductivity is drawn and annealed to stringent specifications. The automatic on-line controls in our extrusion process consistently give high quality to Finolex Winding Wires.

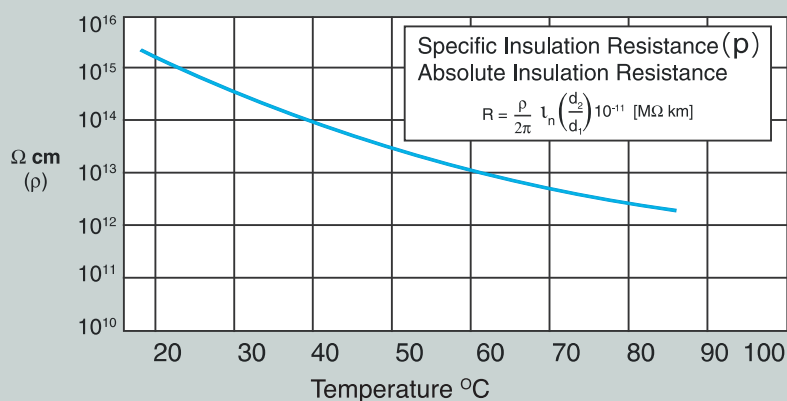
SPECIAL RANGE

Finolex has developed a special range of winding wires with stranded copper conductor insulated with HR PVC compound for higher HP submersible pump motors. These are also manufactured to individual customer specifications.

**Table 1 - HR PVC Insulated Winding Wires as per IS 8783 (Part 4/Sec 1): 1995
(Solid Copper Conductor)**



Nom. Conductor Diameter (mm.)	Nom. Cross-Sectional Area (sq.mm.)	Min. Insulation Thickness (mm.)	Approx. Overall Diameter (mm.)	Max. Conductor Resistance at 20°C (Ohms/km)
0.60	0.283	0.25	1.15	62.81
0.70	0.385	0.30	1.35	46.14
0.80	0.502	0.30	1.45	35.33
0.90	0.638	0.30	1.55	27.91
1.00	0.785	0.30	1.65	22.61
1.10	0.950	0.30	1.75	18.69
1.20	1.13	0.30	1.85	15.70
1.30	1.33	0.30	1.95	13.38
1.40	1.54	0.35	2.15	11.54
1.50	1.77	0.35	2.25	10.05
1.60	2.01	0.35	2.35	8.83
1.70	2.27	0.35	2.45	7.82
1.80	2.54	0.35	2.55	6.98
1.90	2.84	0.35	2.65	6.26
2.00	3.14	0.45	2.95	5.65
2.10	3.46	0.45	3.05	5.13
2.20	3.80	0.45	3.15	4.67
2.30	4.15	0.45	3.25	4.27
2.40	4.52	0.50	3.45	3.93
2.50	4.91	0.50	3.55	3.62
2.60	5.31	0.50	3.65	3.34
2.70	5.73	0.50	3.75	3.10
2.80	6.16	0.55	3.95	2.88
3.00	7.07	0.55	4.15	2.51
2.90	6.61	0.55	4.05	2.69
3.20	8.04	0.70	4.65	2.21

TABLE 2 - SPECIFIC INSULATION RESISTANCE Vs TEMPERATURE

IS:8783

 PART 4
 SEC 1
 CM/L-2168452

Physical Properties : The limiting values of solid copper conductor diameter. Elongation at break and other technical details are as given in IS 8783 (Part 1): 1995

The properties of PVC compound are as given in IS 8783 (Part 2): 1995

The Winding Wires are tested as per IS 8783 (Part 3): 1995

INSTRUCTIONS FOR USE

All due care is taken in handling of "Winding Wires" from manufacturing to packing stage. This product being delicate and its application being critical, for troublefree performance of the pump, proper care should be taken during handling, storage and its insertion into stator slots to ensure desired product performance.

These wires are subjected to stringent quality checks. High voltage test is carried out on each and every coil produced. Repeated tests at customer's end should therefore be avoided. Only megger test is recommended to be carried out at customer's end.

Do not stack more than 4 to 5 coils as the bottom most coil is likely to get damaged by weight. Do not store these wires near objects having sharp edges or high temperatures, to avoid unintentional damage.

Do not use hammer to give shape to the bunch of coils to fit them into the motor. These wires lend themselves to be easily moulded into any desired shape. Ensure proper jointing with 3 Core Flat Cable to avoid failure. Ensure that these wires are stored at normal room temperature.

PVC INSULATED THREE CORE ROUND DOUBLE SHEATHED CABLES FOR SUBMERSIBLE PUMPS

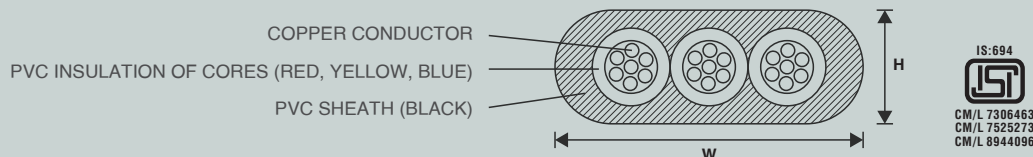
Double sheathed round 3 core cables are popularly used in overseas markets as an alternative to 3 core flat cables. The double sheath not only offers better mechanical protection from abrasion, but also prevents ingress of water along the interstices of the cable. Bright annealed flexible copper conductor used in these cables. is insulated and sheathed with special grades of in-house formulated and manufactured PVC compounds.

Size (mm')	Max.Conductor Resistance at 20°C (ohm/km)	Insulation Thickness (Nom.) (mm)	Total Thickness of Double Sheath (Nom.) (mm)	Overall Diameter (Approx.) (mm)
1.5	13.3	0.6	1.60	9.9
2.5	7.98	0.7	1.60	11.5
4	4.95	0.8	1.60	13.5
6	3.30	0.8	1.80	15.0
10	1.91	1.0	2.00	18.6
16	1.21	1.0	2.20	21.8
25	0.780	1.2	2.40	26.5
35	0.554	1.2	2.40	29.0
50	0.386	1.4	2.80	34.9
70	0.272	1.4	3.00	39.7
95	0.206	1.6	3.10	45.0

3 CORE FLAT PVC CABLES

Finolex 3 core flat cables are manufactured keeping in mind the severe and difficult conditions in which they are required to perform. The individual conductors are made from bright electrolytic-grade copper. The wires are drawn, annealed, and bunched properly to ensure flexibility and uniform resistance. Each of the three copper conductors are insulated with a special PVC compound that is formulated and manufactured in-house. The cores are laid up in a flat, parallel formation. The outer sheath of the cable is extruded with a special grade of abrasion resistance PVC compound in black colour which is impervious to water, grease, oil, etc.

TECHNICAL DATA



3 CORE FLAT CABLES AS PER IS 694: 1990 WITH ISI MARK

Conductor	Insulation	Sheath	Overall Dimensions (Approx) 'W' 'H' mm	Conductor Resistance @20°C (max) Ohms/km.	Current Carrying Capacity @40°C Amps
Area sq. mm.	Thickness (Nom) mm	Thickness (Nom) mm			
1.5*	0.6	0.9	10.0 x 4.80	12.10	14
2.5*	0.7	1.0	12.50 x 5.70	7.41	18
4.0**	0.8	1.0	14.20 x 6.40	4.95	26
6.0**	0.8	1.10	16.15 x 7.20	3.30	31
10.0**	1.0	1.40	20.90 x 9.15	1.91	42
16.0**	1.0	1.40	24.25 x 10.50	1.21	57
25.0**	1.2	2.00	30.75 x 13.85	0.780	72
35.0**	1.2	2.00	34.50 x 15.00	0.554	90
50.0**	1.4	2.20	40.70 x 18.10	0.386	115
70.0**	1.4	2.20	46.40 x 20.35	0.272	143
95.0**	1.6	2.40	52.50 x 23.00	0.206	165

Note:

The strand diameter is nominal. However, construction of the conductor is designed to satisfy the requirements of conductor resistance as per IS 8130: 2013

*As per Conductor Class 2 of IS 8130 : 2013

** As per Conductor Class 5 of 8130 : 2013

Note:

The number of wires and the strand diameter will be such as to satisfy the requirements of conductor resistance as per IS 8130 : 2013

SECTION GUIDE FOR 3 CRORE FLAT PVC CABLES

1. HP Vs Current: The full load current for submersible pump motors, 3 phase, 50 cycles, 415 - 425 V.

HP	5.0	7.5	10.0	12.5	15.5	17.5	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0
AMP	7.5	11.0	14.9	18.9	22.5	25.2	28.4	35.6	42.3	50.4	58.1	62.1	67.5	73.8	81.0	87.3	93.6	100.8	108.0

2. Derating Factors: Multiply the current carrying capacity of the cable by factors given below for various ambient temperatures.

Ambient Temperature °C	30	35	40	45	50
Rating Factor	1.09	1.04	1.00	0.95	0.77

Finolex

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