



Prysmian
Group



MAKERS OF QUALITY CABLES



www.aclcables.com

 associated
cables pvt. ltd.



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Welcome to ACPL

Corporate Information

BANKERS

HSBC Bank, Andheri (East) Br.,
Mumbai - 400 093,
A/c. No.: 003-613841-001,
IFSC: HSBC0400003

YEAR OF ESTABLISHMENT

27th July, 1973

TYPE OF COMPANY

Private Limited Company

CIN NUMBER

U31300MH1973PTC016713

PF REGISTER NUMBER

PUKOL0018792000

FACTORY REGISTER NUMBER

122802732000410

GST NUMBER

27AABCA2809H1ZY

PAN NUMBER

AABCA2809H

FACTORY AREA

50,092 Sq. Mtrs.

SHAREHOLDER

Oman Cables Industry (SAOG), Sultanate of Oman
Group of Prysmian, Draka, General Cables



VISION

To be a leading cable company in India, adhering to uncompromising quality achieved through technical competence to produce Instrumentation, Control & Power cables.



MISSION

To be customer centric and provide quality cables at competitive prices. To continuously upgrade technical & manufacturing competence by imbibing best practices of Prysmian Group thus delivering value to customer.





ACPL AT A GLANCE

Established in 1973, ACPL is the first and the largest dedicated Instrumentation Cable manufacturing company in India. ACPL also manufactures Control Cables, Thermocouple Cables & Special Application Cables. The company's state-of-the-art manufacturing facility is located at Chiplun in Ratnagiri district of Maharashtra and the company is ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 accredited by TUV-SUD.

ACPL is part of the **Prysmian Group**, subsequent to the acquisition of **Draka** by **Prysmian** in Feb 2011. **Prysmian** is the world's largest cable group with a turnover in excess of €11 billion, for 2019. We're an innovative world leader when it comes to cable technology and we match that with an impressive worldwide presence. Spanning 50 countries, 106 plants, 25 research and development centres & with about 29,000 employees, we've a strategic footprint that allows us to service emerging markets & communities across the globe with ease.

ACPL is professionally managed by a experienced, competent & dedicated team under guidance of Board of Director that includes Directors from **Prysmian** and **Oman Cables of Oman**. As part of the **Prysmian Group** ACPL has access to technology and wide variety of cables solutions and is able to deliver quality cables to meet the requirement of varied customers.

Exports account for a large part of ACPL sales turnover and has been accorded the status of "**Star Export House**" by Director General of Foreign Trade.

ACPL HISTORY & IT'S EVOLUTION

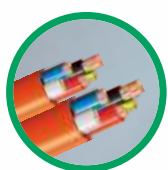
- **1973** | ACPL was established as **first Instrumentation & Speciality Cables manufacturing Company** in India.
- **1975** | ACPL developed first time in India Screened Instrumentation Cables for the **first offshore oil rig of Government of India**.
- **1995** | ACPL became a member of the Draka Group. It was formed as a Joint Venture with **Draka UK Group Limited**, a fully owned subsidiary of **Draka Holding N.V.** Thereafter Draka acquired 48% equity.
- **2005** | Draka acquired 96% equity in ACPL and later on 100% equity.
- **2006** | Draka transferred 40% of ACPL equity to **Oman Cables Industry (S.A.O.G.)**.
- **2011** | ACPL was proud to be part of PRYSMIAN, the **world's largest cable manufacturing group**, by merger of **Draka UK** into **Prysmian Treasury B.V.** holding 60% equity in ACPL and balance 40% by Oman Cables Industry (S.A.O.G.).
- **2017** | On 5th December, 2017, Oman Cables Industry (S.A.O.G.), Sultanate of Oman increased its equity holding from 40% to 100%. ACPL is now a wholly owned subsidiary of **Oman Cables Industry (S.A.O.G.)**.
- **2019** | **Expansion / Modernization** Project undertaken in 2019 / 2020.



PRODUCT RANGE

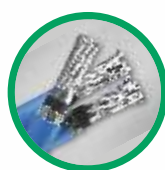
ACPL offer wide range of specialty instrumentation cables, manufactured to various international standards and also as per specific requirement of the individual customers.

- Fire Resistant Cables
- Thermocouple Cables
- Special Application Cable
- Instrumentation Cables
- Control Cables
- Power Cables



Fire Resistant Cables

The Fire Resistant cables continue to operate during a fire, to enable continuous functioning of essential life safety systems like Fire alarms, Voice / Audio alarms, CCTV, Emergency Power and Smoke extraction etc. Cables are tested as per IEC 60332 Part 3, IEC 60754, IEC 60331, IEC 61034 and BS 6387.



Instrumentation Cables

Instrumentation cables have very diverse applications in process industries, oil exploration, petrochemicals, refineries, fertilizer, cement plants, steel, paper and power plants etc. Associated Cables Pvt. Ltd. is the first company in India to manufacture screened instrumentation cables.



Thermocouple Cables

Thermocouple extension or compensating cables essentially transfer reference junctions to the control room. The construction of thermocouple cables is in principle similar to instrumentation cables. However, characteristics are very special and are tested to various international standards.



Control Cables

Control cables are used for various power applications in industries. Control cables are manufactured as per various national & international standards, such as IS 1554 P-1, IEC 5021, BS 6346, IS 7098 P-1, IEC 60502-1, BS 5467. Control cables as per specific customer requirement can also be manufactured.



Special Application Cable

The range includes flat and round elevator cables. Cables can also be manufactured to suit customer needs. Composite cable for Control, Power & Instrumentation application. Different type of screening like Copper wire, Copper Tape, etc.



Power Cables

Low voltage 1.1 Kv Power Cables with Copper conductor for power circuits with effective current carrying capacities in PVC & XLPE insulation. Armoured or unarmoured as per IS 1554 P-1, IS 7098 P-1, IEC 60502-1, BS 5467, BS 6346.

INSTRUMENTATION CABLES

(Reference Standard BSEN 50288-7)

- Instrumentation cable for low voltage 300V, 500V application.
- These cables are used in various industries for transmission of analog /digital signals for measurement and process control purpose.

Operating temperature : 70°C & 90°C (depends upon the selection of insulation compound).

Product Sizes : 0.50 Sq.mm to 4 Sq.mm up to 48 Pairs/ Triads/ Quad element/ cores.

Conductor : Annealed bare Copper/tinned Copper, solid or stranded Copper conductor (IEC-60228 Class 1 & 2).

Insulation : PVC/ PE/ XLPE

Screening : Individual & Overall screening with Al-Mylar, Polyester tape and drain wire.

Armouring : Galvanized round wire and Flat strip conforming to IS/ BS standard.

Sheathing : PVC/ FR/ FRLS/ FROR/ LSF Inner & Outer sheath.



Element Screened



Overall Screened



Element + Overall Screened

Characteristics of Instrumentation Cables

		0.5mm ²	0.75mm ²	1.0mm ²	1.5mm ²	2.5mm ²	Unit
Mutual Capacitance Core to Core (PVC insulation)	<	250	250	250	250	250	pF / m
Mutual Capacitance Core to Core (Polyethylene XLPE insulation)	<	115	115	115	115	115	pF / m
L/R Ratio		25	25	25	40	60	μH / Ohm
Conductor Resistance (D.C.Resistance at 20°C)	<	39.7	26.5	18.4	12.3	7.41	Ohms - Km
Insulation Resistance PVC	>	100	100	100	100	100	M Ohms - Km
Insulation Resistance Polyethylene / XLPE	>	5000	5000	5000	5000	5000	M Ohms - Km
Core - Core / Screen / Armour Insulation Resistance at 500 V (PVC)	>	25	25	25	25	100	M Ohms - Km
Screen to Screen Insulation Resistance at 500 V	>	1	1	1	1	1	M Ohms - Km

THERMOCOUPLE EXTENSION / COMPENSATING CABLES

(Reference Standard - IS-8784, ANSI-96.1, IEC-60584)

Thermocouple cables are used to sense process temperature and are connected to the controllers for indication & control.

Operating temperature: 70°C & 90°C (depends upon selection of Insulation compound).

Range : 20 AWG to 16 AWG (KX / VX / KXA / JX / TX / NX etc.).

Voltage grade : 300/ 500V, 600V.

Insulation : PVC/ PE/ XLPE.

Colour code Insulation /

Outer sheath : As per the relevant standard.

Screening : Individual & Overall screening with Al-Mylar, Polyester tape and drain wire.

Armouring : Galvanized round and Flat strip conforming to IS/ BS Standard.

Sheathing : PVC/ FR/ FRLS/ FROR/ LSF Inner & Outer sheath.



Element Screened



Element + Overall Screened



Element + Overall Screened

Codes/ Conductor combination characteristics of various standards of Extension & Compensating Cables			Colour Codes for Thermocouple Extension and Compensating Cables							
			British Standard BS - 1843		American Standard ANSI MC - 96.1		Indian Standard IS - 8784		International Electrotechnical Commission IEC - 60584 -1,2	
Code	Conductor Combinations									
	+VE Leg	-VE Leg								
KX	Nickel Chromium	Nickel Aluminium		+/-2.5°C		+/-2.2°C		+/-2.2°C		+/-2.5°C
VX	Copper	Copper Nickel		+/-2.5°C		+/-2.2°C	—	—		+/-2.5°C
TX	Copper	Copper Nickel		+/-1.0°C		+/-1.0°C		+/-1.0°C		+/-1.0°C
JX	Iron	Copper Nickel		+/-2.5°C		+/-2.2°C		+/-2.2°C		+/-2.5°C
EX	Nickel Chromium	Copper Nickel		+/-2.5°C		+/-1.7°C		+/-1.7°C		+/-2.5°C
RX	Copper	Copper Alloy		+/-2.5°C		+/-1.5°C		+/-1.5°C		+/-2.5°C
SX	Copper	Copper Alloy		+/-2.5°C		+/-1.5°C		+/-1.5°C		+/-2.5°C
BX	Copper	Copper Alloy	—	—		+/-0.5°C		+/-0.5°C	—	—

LV CONTROL & POWER CABLES

(Reference Standard- IEC 60502-1, BS-5467, BS-6724, IS-1554 P-1, IS-7098-1)

Control & Power Cables are used for Indoor, Outdoor application or for control panels, power & switching systems, industrial plants and by electricity boards.

Operating temperature : 70°C, 85°C, & 90°C (depends upon selection of insulation compound).

Product Size : Single or Multicore 0.50 Sq.mm to 4 Sq.mm for Control Cables and 1.5 Sqmm to 50 Sqmm for Power Cables.

Voltage grade : 600/ 1000 V/ 1100V.

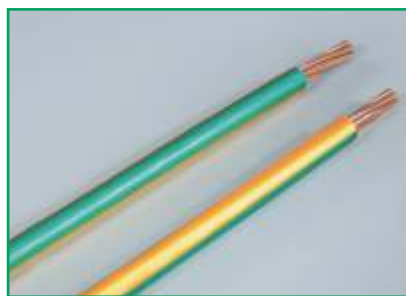
Conductor : Annealed bare Copper/ tinned Copper, solid or stranded Copper conductor (IEC - 60228, IS-8130 Class 1 & 2).

Insulation : PVC / XLPE.

Armouring : Galvanized round and Flat strip conforming to IS/BS Standard.

Sheathing : PVC/ FR/ FRLS/ FROR/ FRRT/ LSF Inner & Outer sheath.

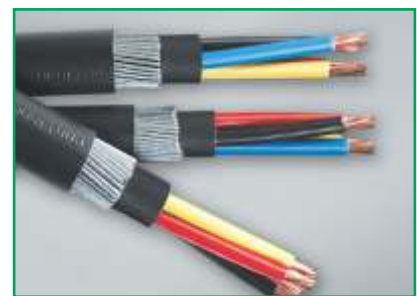
Note : Copper tape screening as per customer requirement.



Earthing Cable



Earthing Cable



Unshielded

Insulation Material Properties

Insulation Material	Tensile Strength	Elongation at Ereak	Operating Temp.	Short Circuit Temp. Rating	Dielectric Constant	Dissipation Factor	Volume Resistivity
	N/mm ²	%	°C	°C	10 ³ Hz	10 ³ Hz	Ω - Cm
PVC	>13	250	70	135	4~7	0.02~0.04	10
Polyethylene	>14	500	70	200	2.27	0.0003	10
XLPE	>15	500	90	250	2.3	0.005	10

Insulation material	Abrasion resistance	Oil resistance	Solvent resistance	Water resistance	Flame retardance	Radiation resistance	Flexibility
PVC	Yellow	Grey	Yellow	Grey	Grey	Yellow	Yellow
Polyethylene	Grey	Yellow	Grey	Grey	Blue	Yellow	Yellow
XLPE	Yellow	Grey	Grey	Grey	Blue	Grey	Blue

Poor

Fair

Good

FIRE RESISTANT / PILOT CABLES

(Reference Standard - BSEN-50288-7, IEC 60502-1, IS-694, IEC-60331, IEC-60332)

Fire resistant cables are used for fire alarm and smoke detection systems, emergency lighting & evacuation systems. Pilot Cables are used for power distribution & transmission systems.

- Operating temperature** : 70°C & 90°C (depends upon selection of insulation compound).
- Product Range** : For Multicore 0.5 sq.mm. to 50 sq.mm. & up to 300 sq.mm. for single core
- Voltage grade** : 600/ 1000 V/ 1100V.
- Conductor** : Annealed bare Copper / tinned Copper, solid or stranded Copper conductor (IEC -60228, IS-8130 Class 1, 2).
- Insulation** : PVC / PE / XLPE.
- Armouring** : Galvanized round and Flat strip conforming to IS/BS standard.
- Sheathing** : PVC/ FR/ FRLS/ FROR/ FRRT/ LSF Inner & Outer sheath.



Construction of cable

Construction	Description
1 Conductor	Stranded annealed copper
2 Fire Barrier	Mica tape
3 Insulation	Cross-linked polyethylene (XLPE)
4 Shield	Aluminium foil with tinned copper drain wire
5 Filler*	LSF filler or polyethylene split yarn
6 Binder Tape*	Polyester tape
7 Bedding*	Low smoke halogen free (LSF) compound (Orange)
8 Armour */#	Galvanised steel wire (Copper wire for single core cable) Galvanised steel Flat Strip
9 Sheath	Low smoke halogen free (LSF) compound (Orange)

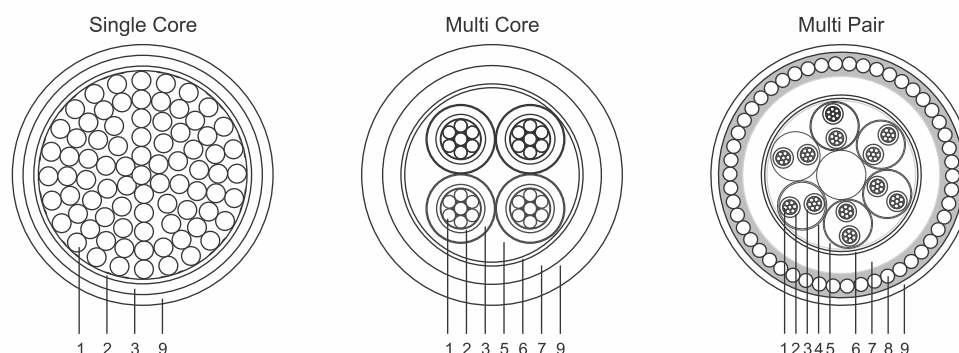




TABLE-1A

PVC INSULATED CABLE

Technical Data for Class-2 conductor as per IS: 8130 - 1984

Conductor cross sectional Area (Note 1) sq. mm	Minimum No of wires		Maximum D.C. Resistance @ 20 deg. C			Maximum A.C. Resistance @ 70 deg. C			Maximum A.C. Resistance @ 85 deg. C							
	Non Compacted		Compacted			Plain Copper			Tinned Copper			Aluminium				
	Circular	(Circular / Shaped)	Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium					
	CU	AL	CU	AL	AL	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
1.50	3	3	-	-	-	12.10	12.20	18.10	14.50	14.62	21.70	15.20	15.33	22.80		
2.50	3	3	-	-	-	7.41	7.56	12.10	8.90	9.08	14.50	9.30	9.49	15.30		
4	7	3	-	-	-	4.61	4.70	7.41	5.52	5.63	8.90	5.79	5.90	9.35		
6	7	3	-	-	-	3.08	3.11	4.61	3.69	3.73	5.54	3.87	3.91	5.82		
10	7	7	6	-	-	1.83	1.84	3.08	2.19	2.20	3.70	2.30	2.31	3.89		
16	7	7	6	6	6	1.15	1.16	1.91	1.38	1.39	2.30	1.44	1.45	2.41		
25	7	7	6	6	6	0.727	0.734	1.20	0.87	0.88	1.44	0.913	0.92	1.51		
35	7	7	6	6	6	0.524	0.529	0.868	0.63	0.64	1.04	0.658	0.66	1.10		
50	19	19	6	6	6	0.387	0.391	0.641	0.464	0.469	0.770	0.486	0.491	0.809		
70	19	19	12	12	12	0.268	0.270	0.443	0.321	0.323	0.533	0.337	0.340	0.559		
95	19	19	15	15	15	0.193	0.195	0.32	0.232	0.234	0.385	0.243	0.246	0.404		
120	37	37	18	15	15	0.153	0.154	0.253	0.184	0.185	0.305	0.193	0.194	0.320		
150	37	37	18	15	15	0.124	0.126	0.206	0.150	0.152	0.249	0.157	0.160	0.261		
185	37	37	30	30	30	0.0991	0.100	0.164	0.121	0.122	0.198	0.126	0.127	0.208		
240	61	37	34	30	30	0.0754	0.0762	0.1250	0.0930	0.0940	0.1520	0.0972	0.0982	0.1590		
300	61	61	34	30	30	0.0601	0.0607	0.1000	0.0750	0.0757	0.1220	0.0787	0.0795	0.1280		
400	61	61	53	53	53	0.0470	0.0475	0.0778	0.0604	0.0610	0.0961	0.0630	0.0636	0.1010		
500	61	61	53	53	53	0.0366	0.0369	0.0605	0.0490	0.0494	0.0761	0.0509	0.0513	0.0796		
630	91	91	53	53	53	0.0283	0.0286	0.0469	0.0401	0.0405	0.0606	0.0416	0.0420	0.0632		
800	91	91	53	53	53	0.0221	0.0224	0.0367	0.0339	0.0343	0.0495	0.0351	0.0355	0.0515		
1000	91	91	53	53	53	0.0176	0.0177	0.0291	0.0297	0.0298	0.0416	0.0306	0.0307	0.0431		

Note 1 : Conductors of 1.5sq.mm to 10sq.mm can be manufactured as per class-1 solid conductor as per IS 8130.



TABLE-1B

Technical Data for Class-5 Flexible Copper conductor as per IS: 8130 - 1984

Conductor cross sectional Area	Maximum dia of individual strand in conductor	Maximum D.C. Resistance		Maximum A.C. Resistance		Maximum A.C. Resistance	
		@ 20 deg. C		@ 70 deg. C		@ 85 deg. C	
		Plain Copper	Tinned Copper	Plain Copper	Tinned Copper	Plain Copper	Tinned Copper
sq.mm	mm	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
0.50	0.21	39.00	40.10	46.69	48.01	49.16	50.54
0.75	0.21	26.00	26.70	31.14	31.98	32.84	33.72
1.00	0.21	19.50	20.00	23.36	23.96	24.68	25.30
1.50	0.26	13.30	13.70	15.94	16.41	16.71	17.21
2.50	0.26	7.98	8.21	9.58	9.86	10.02	10.31
4	0.31	4.95	5.09	5.93	6.09	6.22	6.39
6	0.31	3.30	3.39	3.95	4.06	4.15	4.26
10	0.41	1.91	1.95	2.29	2.33	2.40	2.45
16	0.41	1.21	1.24	1.45	1.49	1.52	1.55
25	0.41	0.780	0.795	0.933	0.951	0.980	0.999
35	0.41	0.554	0.565	0.666	0.679	0.696	0.710
50	0.41	0.386	0.393	0.463	0.471	0.485	0.494
70	0.51	0.272	0.277	0.304	0.310	0.320	0.326
95	0.51	0.206	0.210	0.248	0.252	0.259	0.264
120	0.51	0.161	0.164	0.194	0.197	0.203	0.207
150	0.51	0.129	0.132	0.156	0.160	0.163	0.167
185	0.51	0.106	0.108	0.129	0.132	0.135	0.137
240	0.51	0.0801	0.0817	0.0986	0.1005	0.1031	0.1051
300	0.51	0.0641	0.0654	0.0798	0.0813	0.0837	0.0854
400	0.51	0.0486	0.0495	0.0623	0.0634	0.0650	0.0662
500	0.61	0.0384	0.0391	0.0512	0.0520	0.0532	0.0541
630	0.61	0.0287	0.0292	0.0406	0.0412	0.0421	0.0427



TABLE: 2 - CAPACITANCE

PVC INSULATED CABLE

1.1KV PVC INSULATED CABLES - APPROXIMATE CAPACITANCE (microfarads/km)

Nominal Conductor cross sectional Area sq.mm	Single Core		Two Core	Multicore (More than Two Cores)
	Unarmoured	Armoured		
1.50	0.433	-	0.153	0.369
2.50	0.481	-	0.166	0.408
4	0.576	-	0.186	0.482
6	0.673	-	0.201	0.554
10	0.831	-	0.221	0.671
16	0.965	0.776	0.236	0.770
25	1.005	0.833	0.245	0.809
35	1.156	0.955	0.259	0.922
50	1.160	0.982	0.268	0.933
70	1.306	1.102	0.275	1.024
95	1.341	1.153	0.282	1.060
120	1.539	1.320	0.297	1.207
150	1.494	1.302	0.296	1.165
185	1.515	1.338	0.300	1.189
240	1.564	1.395	0.304	1.218
300	1.570	1.412	0.306	1.229
400	1.693	1.488	0.308	1.314
500	1.646	1.471	0.310	1.292
630	1.690	1.493	0.316	1.334
800	1.867	1.647	-	-
1000	2.031	1.791	-	-

TABLE 3 - REACTANCE

1.1KV PVC INSULATED CABLES - APPROXIMATE REACTANCE (ohms/km)

Conductor cross sectional Area	Single Core		Multicore
	Unarmoured	Armoured	
1.50	0.1239	-	0.1116
2.50	0.1201	-	0.1077
4	0.1160	-	0.1035
6	0.1106	-	0.0980
10	0.1045	-	0.0918
16	0.0999	0.1058	0.0871
25	0.0989	0.1037	0.0861
35	0.0962	0.1004	0.0833
50	0.0966	0.0997	0.0837
70	0.0910	0.0937	0.0780
95	0.0905	0.0928	0.0775
120	0.0886	0.0906	0.0755
150	0.0889	0.0911	0.0758
185	0.0881	0.0898	0.0750
240	0.0876	0.0891	0.0745
300	0.0870	0.0884	0.0740
400	0.0865	0.0880	0.0730
500	0.0863	0.0879	0.0732
630	0.0859	0.0876	0.0728
800	0.0848	0.0863	-
1000	0.0838	0.0851	-



TABLE 4 A - IMPEDANCE (Plain Copper Conductor) @ 70 & 85 deg. C

1.1KV PVC INSULATED CABLES - APPROXIMATE IMPEDANCE (ohms/km)

Conductor cross sectional Area	Single Core @ 70 deg. C		Multicore @ 70 deg. C	Single Core @ 85 deg. C		Multicore @ 85 deg. C
	Unarmoured	Armoured		Unarmoured	Armoured	
1.50	14.5005	-	14.5004	15.2005	-	15.2004
2.50	8.9008	-	8.9007	9.3008	-	9.3006
4	5.5212	-	5.5210	5.7912	-	5.7909
6	3.6917	-	3.6913	3.8716	-	3.8712
10	2.1925	-	2.1919	2.3024	-	2.3018
16	1.3836	1.3840	1.3827	1.4435	1.4439	1.4426
25	0.8756	0.8762	0.8743	0.9183	0.9189	0.9171
35	0.6373	0.6379	0.6355	0.6650	0.6656	0.6633
50	0.4739	0.4746	0.4715	0.4955	0.4961	0.4932
70	0.3336	0.3344	0.3303	0.3491	0.3498	0.3459
95	0.2490	0.2499	0.2446	0.2593	0.2601	0.2551
120	0.2042	0.2051	0.1989	0.2124	0.2132	0.2072
150	0.1744	0.1755	0.1681	0.1804	0.1815	0.1743
185	0.1497	0.1507	0.1424	0.1537	0.1547	0.1466
240	0.1278	0.1288	0.1192	0.1308	0.1319	0.1225
300	0.1149	0.1159	0.1054	0.1173	0.1184	0.1080
400	0.1055	0.1067	0.0947	0.1070	0.1082	0.0964
500	0.0992	0.1006	0.0881	0.1002	0.1016	0.0892
630	0.0948	0.0963	0.0831	0.0954	0.0970	0.0838
800	0.0913	0.0927	-	0.0918	0.0932	-
1000	0.0889	0.0901	-	0.0892	0.0904	-

TABLE 4 B- IMPEDANCE (Aluminium Conductor) @ 70 & 85 deg. C

1.1KV PVC INSULATED CABLES - APPROXIMATE IMPEDANCE (ohms/km)

Conductor cross sectional Area	Single Core @ 70 deg. C		Multicore @ 70 deg. C	Single Core @ 85 deg. C		Multicore @ 85 deg. C
	sqmm	Unarmoured		Armoured	Unarmoured	
1.50	21.7004	-	21.7003	22.8003	-	22.8003
2.50	14.5005	-	14.5004	15.3005	-	15.3004
4	8.9008	-	8.9006	9.3507	-	9.3506
6	5.5411	-	5.5409	5.8211	-	5.8208
10	3.7015	-	3.7011	3.8914	-	3.8911
16	2.3022	2.3024	2.3016	2.4121	2.4123	2.4116
25	1.4434	1.4437	1.4426	1.5132	1.5136	1.5125
35	1.0444	1.0448	1.0433	1.0146	1.0150	1.0134
50	0.7760	0.7764	0.7745	0.8147	0.8151	0.8133
70	0.5407	0.5412	0.5387	0.5664	0.5668	0.5644
95	0.3955	0.3960	0.3927	0.4140	0.4145	0.4114
120	0.3176	0.3182	0.3142	0.3320	0.3326	0.3288
150	0.2644	0.2651	0.2603	0.2757	0.2764	0.2718
185	0.2167	0.2174	0.2117	0.2259	0.2266	0.2211
240	0.1754	0.1762	0.1693	0.1815	0.1823	0.1756
300	0.1498	0.1507	0.1427	0.1548	0.1556	0.1479
400	0.1293	0.1303	0.1207	0.1330	0.1340	0.1246
500	0.1151	0.1163	0.1056	0.1174	0.1186	0.1081
630	0.1051	0.1065	0.0947	0.1066	0.1080	0.0964
800	0.0982	0.0995	-	0.0992	0.1005	-
1000	0.0936	0.0947	-	0.0942	0.0954	-



TABLE 5 A- VOLTAGE DROP (Plain Copper Conductor) @ 70 & 85 deg. C

1.1kV PVC INSULATED CABLES - APPROXIMATE VOLTAGE DROP (mV/A/m)

Conductor cross sectional Area sqmm	Single Phase @ 70 deg. C		3 Phase @ 70 deg. C	Single Phase @ 85 deg. C		3 Phase @ 85 deg. C
	Unarmoured	Armoured		Unarmoured	Armoured	
1.50	29.0011	-	25.0857	30.4010	-	26.2967
2.50	17.8016	-	15.3981	18.6016	-	16.0901
4	11.0424	-	9.5513	11.5823	-	10.0183
6	7.3833	-	6.3860	7.7432	-	6.6972
10	4.3850	-	3.7920	4.6047	-	3.9822
16	2.7672	2.7681	2.3922	2.8869	2.8878	2.4958
25	1.7512	1.7523	1.5125	1.8367	1.8377	1.5865
35	1.2746	1.2759	1.0994	1.3300	1.3312	1.1474
50	0.9479	0.9492	0.8157	0.9910	0.9922	0.8532
70	0.6673	0.6688	0.5715	0.6981	0.6996	0.5984
95	0.4981	0.4997	0.4232	0.5186	0.5202	0.4413
120	0.4084	0.4102	0.3441	0.4247	0.4264	0.3585
150	0.3487	0.3510	0.2908	0.3608	0.3630	0.3016
185	0.2994	0.3014	0.2463	0.3075	0.3095	0.2537
240	0.2555	0.2576	0.2061	0.2617	0.2637	0.2119
300	0.2297	0.2319	0.1823	0.2346	0.2367	0.1869
400	0.2110	0.2135	0.1639	0.2140	0.2165	0.1668
500	0.1985	0.2013	0.1524	0.2004	0.2031	0.1542
630	0.1896	0.1927	0.1438	0.1909	0.1940	0.1451
800	0.1826	0.1854	-	0.1836	0.1863	-
1000	0.1778	0.1803	-	0.1784	0.1809	-

TABLE 5 B- VOLTAGE DROP (Aluminium Conductor) @ 70 & 85 deg. C

1.1kV PVC INSULATED CABLES - APPROXIMATE VOLTAGE DROP (mV/A/m)

Conductor cross sectional Area sqmm	Single Phase @ 70 deg. C		3 Phase @ 70 deg. C	Single Phase @ 85 deg. C		3 Phase @ 85 deg. C
	Unarmoured	Armoured		Unarmoured	Armoured	
1.50	43.4007	-	37.5415	45.6007	-	39.4445
2.50	29.0010	-	25.0857	30.6009	-	26.4697
4	17.8015	-	15.3980	18.7014	-	16.1765
6	11.0822	-	9.5857	11.6421	-	10.0700
10	7.4030	-	6.4030	7.7828	-	6.7316
16	4.6043	4.6049	3.9819	4.8241	4.8246	4.1720
25	2.8868	2.8875	2.4956	3.0265	3.0271	2.6165
35	2.0889	2.0897	1.8050	2.0291	2.0300	1.7532
50	1.5521	1.5529	1.3399	1.6295	1.6302	1.4070
70	1.0814	1.0823	0.9319	1.1327	1.1336	0.9764
95	0.7910	0.7921	0.6794	0.8280	0.8290	0.7117
120	0.6352	0.6363	0.5436	0.6641	0.6652	0.5688
150	0.5288	0.5303	0.4503	0.5514	0.5529	0.4702
185	0.4334	0.4348	0.3663	0.4518	0.4531	0.3825
240	0.3509	0.3524	0.2928	0.3631	0.3645	0.3038
300	0.2997	0.3013	0.2469	0.3095	0.3111	0.2558
400	0.2586	0.2606	0.2088	0.2660	0.2679	0.2156
500	0.2301	0.2325	0.1827	0.2348	0.2372	0.1871
630	0.2102	0.2130	0.1639	0.2133	0.2160	0.1668
800	0.1964	0.1990	-	0.1984	0.2010	-
1000	0.1871	0.1894	-	0.1885	0.1908	-



TABLE 6 - SHORT CIRCUIT CURRENT RATINGS

1.1kV PVC INSULATED CABLES - Short Circuit Ratings for 1 second for Type "A" PVC & Type "C" HR PVC Insulated Cables.

Conductor cross sectional Area	Type "A" PVC Insulated (for 70 deg. C)		Type "C" HR PVC Insulated (for 85 deg. C)		
	sqmm	Copper	Aluminium	Copper	Aluminium
1.50		0.173	0.114	0.16	0.10
2.50		0.283	0.190	0.26	0.17
4		0.46	0.303	0.42	0.27
6		0.69	0.455	0.62	0.41
10		1.15	0.758	1.04	0.69
16		1.84	1.21	1.66	1.01
25		2.88	1.90	2.59	1.72
35		4.03	2.65	3.63	2.40
50		5.75	3.79	5.19	3.43
70		8.05	5.31	7.26	4.80
95		10.90	7.20	9.86	6.52
120		13.80	9.10	12.45	8.23
150		17.30	11.40	15.57	10.29
185		21.30	14.02	19.2	12.69
240		27.60	18.20	24.91	16.46
300		34.50	22.80	31.13	20.58
400		46.00	30.40	41.51	27.44
500		57.50	38.00	51.89	34.30
630		72.50	47.25	65.38	43.21
800		92.00	60.00	83.02	54.88
1000		115.00	75.00	103.78	68.59

TABLE 7 - CURRENT RATINGS

Current Ratings for 2 Single Core Unarmoured / Armoured Cables according to IS 1554-I

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.				In Duct (30 deg. C) Amp.				In Air (40 deg. C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	25	29	21	24	23	27	19	22	24	29	18	22
2.50	35	41	28	32	31	36	25	29	32	38	25	30
4	46	53	36	42	42	49	33	38	43	52	32	38
6	57	66	44	51	54	63	42	49	54	65	41	49
10	75	87	59	68	72	84	56	65	72	86	56	67
16	94	109	75	87	92	107	71	82	92	110	72	86
25	125	145	97	113	120	139	93	108	125	150	99	119
35	150	174	120	139	140	162	110	128	155	186	120	144
50	180	209	145	168	165	191	130	151	190	228	150	180
70	220	255	170	197	200	232	155	180	235	282	185	222
95	265	307	205	238	230	267	180	209	275	330	215	258
120	300	348	230	267	255	296	200	232	310	372	240	288
150	340	394	265	307	280	325	220	255	345	414	270	324
185	380	441	300	348	305	354	240	278	390	468	305	366
240	420	487	335	389	340	394	270	313	445	534	350	420
300	465	539	370	429	370	429	295	342	500	600	395	474
400	500	580	410	476	405	470	335	389	570	684	455	546
500	540	626	435	505	430	499	355	412	610	732	490	588
630	590	684	485	563	465	539	395	458	680	816	560	672
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. __



TABLE 8 - CURRENT RATINGS

PVC INSULATED CABLE

Current Ratings for 3 Single Core Unarmoured / Armoured Cables according to IS 1554-I

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.				In Duct (30 deg. C) Amp.				In Air (40 deg. C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	22	26	17	20	21	24	17	20	20	24	15	18
2.50	30	35	24	28	29	34	24	28	27	32	21	25
4	39	45	31	36	38	44	30	35	35	42	27	32
6	49	57	39	45	48	56	37	43	44	53	35	42
10	65	75	51	59	64	74	51	59	60	72	47	56
16	85	99	66	77	83	96	65	75	82	98	64	77
25	110	128	86	100	110	128	84	97	110	132	84	101
35	130	151	100	116	125	145	100	116	130	156	105	126
50	155	180	120	139	150	174	115	133	165	198	130	156
70	190	220	140	162	175	203	135	157	205	246	155	186
95	220	255	175	203	200	232	155	180	245	294	190	228
120	250	290	195	226	220	255	170	197	280	336	220	264
150	280	325	220	255	245	284	190	220	320	384	250	300
185	305	354	240	278	260	302	210	244	370	444	290	348
240	345	400	270	313	285	331	225	261	425	510	335	402
300	375	435	295	342	310	360	245	284	475	570	380	456
400	400	464	325	377	335	389	275	319	550	660	435	522
500	425	493	345	400	355	412	295	342	590	708	480	576
630	470	545	390	452	375	435	320	371	660	792	550	660
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. __

TABLE 9 - CURRENT RATINGS

Current Ratings for Two Cores Unarmoured / Armoured Cables according to IS 1554-I

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.				In Duct (30 deg. C) Amp.				In Air (40 deg. C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	23	27	18	21	20	23	16	19	20	24	16	19
2.50	32	37	25	29	27	31	21	24	27	32	21	25
4	41	48	32	37	35	41	27	31	35	42	27	32
6	50	58	40	46	44	51	34	39	45	54	35	42
10	70	81	55	64	58	67	45	52	60	72	47	56
16	90	104	70	81	75	87	58	67	78	94	59	71
25	115	133	90	104	97	113	76	88	105	126	78	94
35	140	162	110	128	120	139	92	107	125	150	99	119
50	165	191	135	157	145	168	115	133	155	186	125	150
70	205	238	160	186	180	209	140	162	195	234	150	180
95	240	278	190	220	215	249	170	197	230	276	185	222
120	275	319	210	244	235	273	190	220	265	318	210	252
150	310	360	240	278	270	313	210	244	305	366	240	288
185	350	406	275	319	300	348	240	278	350	420	275	330
240	405	470	320	371	345	400	275	319	410	492	325	390
300	450	522	355	412	385	447	305	354	465	558	365	438
400	490	568	385	447	425	493	345	400	530	636	420	504
500												
630												
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. __

TABLE 10 - CURRENT RATINGS

Current Ratings for Three, Three & Half, Four, Five Cores Unarmoured / Armoured Cables according to IS 1554-I

Conductor cross sectional Area	Direct in Ground (30deg. C) Amp.				In Duct (30deg. C) Amp.				In Air (40deg. C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
	sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC
1.50	21	24	16	19	17	20	14	16	17	20	13	16
2.50	27	31	21	24	24	28	18	21	24	29	18	22
4	36	42	28	32	30	35	23	27	30	36	23	28
6	45	52	35	41	38	44	30	35	39	47	30	36
10	60	70	46	53	50	58	39	45	52	62	40	48
16	77	89	60	70	64	74	50	58	66	79	51	61
25	99	115	76	88	81	94	63	73	90	108	70	84
35	120	139	92	107	99	115	77	89	110	132	86	103
50	145	168	110	128	125	145	95	110	135	162	105	126
70	175	203	135	157	150	174	115	133	165	198	130	156
95	210	244	165	191	175	203	140	162	200	240	155	186
120	240	278	185	215	195	226	155	180	230	276	180	216
150	270	313	210	244	225	261	175	203	265	318	205	246
185	300	348	235	273	255	296	200	232	305	366	240	288
240	345	400	275	319	295	342	235	273	355	426	280	336
300	385	447	305	354	335	389	260	302	400	480	315	378
400	425	493	335	389	360	418	290	336	455	546	375	450
500												
630												
800												
1000												





TABLE 11 - THICKNESSES

PVC INSULATED CABLE

Insulation, Innersheath, Outersheath Thicknesses of PVC Insulated Cables according to IS 1554-1

Conductor cross sectional Area A1: V24	Nominal Insulation Thickness		Minimum Innersheath Thickness				Minimum Outersheath Thickness (Flat strip armoured cable)				Minimum Outersheath Thickness (Round wire armoured cable)				Nominal Outersheath Thickness (Unarmoured cable)					
	Single Core Armoured	Multicore & Single Core Unarmoured	2 Core		3 Core		3.5 Core		4 Core		1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
			mm	mm	mm	mm	mm	mm	mm	mm										
1.50	-	0.80	0.30	0.30	0.30	0.30	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
2.50	-	0.90	0.30	0.30	0.30	0.30	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
4	-	1.00	0.30	0.30	0.30	0.30	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
6	-	1.00	0.30	0.30	0.30	0.30	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
10	-	1.00	0.30	0.30	0.30	0.30	-	-	-	1.40	-	1.24	1.40	-	1.40	1.80	1.80	1.80	-	1.80
16	-	1.00	0.30	0.30	0.30	0.30	-	1.40	1.40	-	-	1.40	1.40	-	1.40	1.80	1.80	1.80	-	1.80
25	1.50	1.20	0.30	0.30	0.30	0.30	1.24	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.80	2.00	2.00	2.00	2.00	2.00
35	1.50	1.20	0.30	0.30	0.30	0.30	1.24	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.80	2.00	2.00	2.00	2.00	2.00
50	1.70	1.40	0.30	0.30	0.30	0.40	1.24	1.40	1.56	1.56	1.56	1.56	1.56	1.56	1.80	2.00	2.00	2.00	2.00	2.00
70	1.70	1.40	0.30	0.40	0.40	0.40	1.24	1.56	1.56	1.56	1.40	1.56	1.56	1.56	1.80	2.00	2.00	2.20	2.20	2.20
95	1.90	1.60	0.40	0.40	0.40	0.40	1.40	1.56	1.56	1.56	1.40	1.56	1.72	1.72	1.80	2.20	2.20	2.20	2.20	2.40
120	1.90	1.60	0.40	0.40	0.50	0.50	1.40	1.56	1.72	1.72	1.40	1.72	1.72	1.88	2.00	2.20	2.20	2.20	2.40	2.40
150	2.10	1.80	0.40	0.50	0.50	0.50	1.40	1.72	1.88	1.88	1.40	1.72	1.88	1.88	2.04	2.40	2.40	2.40	2.40	2.60
185	2.30	2.00	0.50	0.50	0.60	0.60	1.40	1.88	1.88	2.04	1.40	1.88	2.04	2.04	2.20	2.40	2.40	2.60	2.60	2.80
240	2.50	2.20	0.50	0.60	0.60	0.60	1.40	2.04	2.20	2.20	1.56	2.04	2.20	2.36	2.60	2.80	2.80	3.00	3.00	3.00
300	2.70	2.40	0.60	0.60	0.70	0.70	1.56	2.20	2.36	2.36	1.56	2.20	2.36	2.52	2.68	2.80	3.00	3.20	3.20	3.40
400	3.00	2.60	0.70	0.70	0.70	0.70	1.56	2.36	2.52	2.68	1.56	2.52	2.68	2.84	2.84	3.20	3.20	3.40	3.40	3.60
500	3.40	3.00	0.70	0.70	0.70	0.70	1.56	2.68	2.84	3.00	1.72	2.84	3.00	3.00	3.00	3.40	3.40	3.60	3.80	4.00
630	3.90	3.40	0.70	0.70	0.70	0.70	1.72	2.84	3.00	3.00	1.88	3.00	3.00	3.00	3.00	3.80	3.80	4.00	4.00	4.00
800	3.90	3.40	-	-	-	-	1.88	-	-	-	1.88	-	-	-	2.40	-	-	-	-	-
1000	3.90	3.40	-	-	-	-	2.04	-	-	-	2.04	-	-	-	2.60	-	-	-	-	-



TABLE 12 - OVERALL DIAMETER (OD)

Overall Diameter of PVC Insulated Cables according to IS 1554-1

Conductor cross sectional Area	Approximate O.D. (+/-2 mm) - Uj-armed				Approximate O.D. (+/-2 mm) - Flat strip armoured				Approximate O.D. (+/-2 mm) - Round wire armoured				Nominal Diameter of Round wire armour								
	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	7.0	12	12	-	13	-	-	-	-	-	-	14	14	14	15	-	1.40	1.40	1.40	-	1.40
2.50	8.0	13	14	-	15	-	-	-	-	-	-	15	16	16	17	-	1.40	1.40	1.40	-	1.40
4	8.5	15	15	-	17	-	-	-	-	-	-	17	18	18	19	-	1.40	1.40	1.40	-	1.40
6	9.0	16	17	-	18	-	-	-	-	-	-	18	19	19	20	-	1.40	1.40	1.40	-	1.40
10	10	17	18	-	20	-	-	-	-	22	-	20	21	21	23	-	1.40	1.40	1.40	-	1.60
16	11	18	19	-	21	-	19	20	-	22	-	20	21	21	23	-	1.60	1.60	1.60	-	1.60
25	13	20	23	25	25	-	21	23	25	26	15	23	24	24	27	140	1.60	1.60	1.60	1.60	1.60
35	14	22	24	27	27	-	23	25	27	28	16	24	26	26	29	140	1.60	1.60	1.60	1.60	1.60
50	16	25	28	30	32	-	26	29	32	32	18	28	30	30	34	140	1.60	1.60	1.60	1.60	2.00
70	17	28	31	33	36	-	29	32	35	35	20	30	34	34	37	140	1.60	1.60	2.00	2.00	2.00
95	19	32	36	38	41	21	33	36	40	40	22	35	38	38	42	160	2.00	2.00	2.00	2.00	2.00
120	21	33	37	42	43	23	34	37	42	43	24	36	39	39	44	160	2.00	2.00	2.00	2.00	2.00
150	23	36	41	45	48	25	37	41	46	47	26	39	43	43	48	160	2.00	2.00	2.00	2.00	2.50
185	25	40	46	50	53	27	41	45	51	52	28	43	49	49	54	160	2.00	2.00	2.50	2.50	2.50
240	28	45	52	57	60	29	46	51	57	58	31	49	54	54	60	160	2.50	2.50	2.50	2.50	2.50
300	30	50	57	63	66	32	51	56	63	64	33	54	59	59	67	160	2.50	2.50	2.50	3.15	3.15
400	34	56	64	70	74	36	57	62	70	72	38	61	67	67	74	200	3.15	3.15	3.15	3.15	3.15
500	38	63	71	79	83	40	63	70	78	81	42	68	75	75	85	200	3.15	3.15	3.15	4.00	4.00
630	43	70	80	89	92	45	71	79	88	90	47	78	85	85	94	200	4.00	4.00	4.00	4.00	4.00
800	47	-	-	-	-	49	-	-	-	-	51	-	-	-	-	2.00	-	-	-	-	-
1000	51	-	-	-	-	54	-	-	-	-	56	-	-	-	-	2.50	-	-	-	-	-



TABLE 13 - WEIGHTS

PVC INSULATED CABLE

Approximate Nett Weight of PVC Insulated Copper Cables according to IS 1554-1

Conductor cross sectional Area	Approximate Nett Weight - Unarmoured					Approximate Nett Weight - Flat strip armoured					Approximate Nett Weight - Round wire armoured				
	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
	sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	70	184	210	-	246	-	-	-	-	-	-	384	434	-	483
2.5	87	235	272	-	323	-	-	-	-	-	-	471	520	-	596
4	111	305	359	-	433	-	-	-	-	-	-	578	656	-	754
6	138	376	450	-	547	-	-	-	-	-	-	673	772	-	906
10	187	511	625	-	771	-	-	-	-	1055	-	857	1013	-	1263
16	256	507	689	-	901	-	698	902	-	1116	350	898	1112	-	1369
25	352	749	1030	1232	1324	-	965	1267	1513	1605	452	1201	1529	1793	1884
35	454	959	1337	1543	1729	-	1196	1595	1844	2029	564	1458	1882	2167	2377
50	601	1273	1793	2093	2360	-	1553	2141	2487	2722	728	1873	2457	2855	3298
70	801	1685	2428	2832	3163	-	2033	2791	3236	3566	958	2366	3341	3868	4225
95	1088	2311	3304	3854	4361	1299	2646	3707	4321	4846	1290	3273	4398	5100	5593
120	1347	2782	4004	4820	5334	1555	3164	4460	5302	5875	1547	3825	5149	6140	6678
150	1619	3383	4913	5665	6487	1855	3803	5433	6251	7050	1853	4492	6208	7110	8363
185	1998	4191	6095	7132	8097	2249	4685	6637	7781	8716	2250	5485	7890	9167	10166
240	2577	5436	7969	9313	10520	2855	5993	8611	9986	11265	2879	7271	9999	11617	12863
300	3189	6783	9881	11510	13113	3516	7400	10606	12258	13873	3516	8813	12146	14744	16405
400	4066	8640	12590	14545	16625	4417	9282	13306	15422	17538	4512	11493	15755	18153	20289
500	5169	10978	16030	18655	21260	5557	11747	16898	19574	22326	5699	14266	19761	23922	26552
630	6647	14133	20652	23855	27225	7098	14927	21695	25028	28445	7264	18877	25840	29768	33240
800	8347	-	-	-	-	8933	-	-	-	-	9016	-	-	-	-
1000	10260	-	-	-	-	10899	-	-	-	-	11174	-	-	-	-

TABLE 14 - WEIGHTS

Approximate Nett Weight of PVC Insulated Aluminium Cables according to IS 1554-1

Conductor cross sectional Area	Approximate Nett Weight - Unarmoured					Approximate Nett Weight - Flat strip armoured					Approximate Nett Weight - Round wire armoured				
	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
	sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	90	259	288	-	337	-	-	-	-	-	-	529	583	-	652
6	105	310	347	-	409	-	-	-	-	-	-	601	664	-	757
10	128	382	432	-	515	-	-	-	-	793	-	730	833	-	1001
16	157	320	408	-	527	-	511	622	-	742	250	711	831	-	994
25	204	451	583	691	728	-	667	820	973	1008	305	903	1082	1252	1288
35	245	536	702	814	882	-	773	959	1115	1182	354	1034	1247	1438	1530
50	309	683	908	1059	1180	-	963	1256	1452	1542	436	1283	1572	1820	2118
70	389	853	1179	1372	1498	-	1201	1543	1776	1901	546	1534	2092	2408	2560
95	503	1129	1531	1786	1997	647	1464	1934	2253	2482	705	2091	2625	3032	3229
120	615	1303	1785	2185	2375	751	1684	2241	2667	2916	815	2346	2929	3504	3719
150	730	1588	2220	2556	2897	889	2008	2740	3142	3460	964	2696	3515	4001	4772
185	889	1950	2734	3180	3615	1061	2444	3276	3829	4235	1141	3244	4529	5215	5685
240	1101	2454	3497	4101	4557	1289	3012	4139	4774	5302	1403	4289	5527	6405	6900
300	1342	3053	4286	5018	5653	1571	3670	5011	5765	6413	1669	5083	6551	8252	8945
400	1701	3862	5423	6258	7069	1943	4504	6139	7135	7983	2147	6715	8588	9866	10734
500	2134	4848	6835	7969	9000	2402	5617	7703	8888	10065	2664	8136	10566	13236	14292
630	2720	6201	8754	10091	11361	3037	6995	9797	11265	12580	3337	10945	13942	16005	17376
800	3307	-	-	-	-	3697	-	-	-	-	3976	-	-	-	-
1000	4037	-	-	-	-	4462	-	-	-	-	4951	-	-	-	-



TABLE 15 - CONTROL CABLES

1.5sqmm Multicore Control PVC Insulated Cables according to IS 1554-1

Minimum Outer sheath Thickness		Nominal Outer sheath Thickness		Round wire dia	Approximate Overall Diameter			Nett Weight of Cable			Current Ratings (TYPE "A" 70°C PVC)			Current Ratings (TYPE "C" HR 85°C PVC)			Standard Drum Length			
Round wire armoured	Flat strip armoured	Un-armoured	mm		Round wire armoured	Flat strip armoured	Un-armoured	Round wire armoured	Flat strip armoured	Un-armoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	In Ground (30°C)	In Duct (30°C)	In Air (40°C)		Amps	Amps	Amps
mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	Amps	Amps	Amps	Amps				
1.24	-	1.80	1.40	1.40	14	-	384	-	184	23	20	20	27	23	24	24	1000			
1.24	-	1.80	1.40	1.40	14	-	434	-	210	21	17	17	24	20	20	20	1000			
1.24	-	1.80	1.40	1.40	15	-	483	-	246	21	17	17	24	20	20	20	1000			
1.24	-	1.80	1.40	1.40	16	-	530	-	279	21	17	17	24	20	20	20	1000			
1.24	-	1.80	1.40	1.40	17	-	597	-	323	15	13	13	17	16	16	16	1000			
1.24	-	1.80	1.40	1.40	17	-	609	-	334	14	13	13	16	16	16	16	1000			
1.24	-	1.80	1.40	1.40	18	-	672	-	373	14	12	12	16	14	14	14	1000			
1.24	-	1.80	1.40	1.40	19	-	740	-	418	13	12	12	15	14	14	14	1000			
1.40	-	1.80	1.40	1.40	21	-	827	-	451	13	11	11	15	13	13	13	1000			
1.40	1.24	1.80	1.60	1.60	22	20	953	690	507	12	10	10	14	12	12	12	1000			
1.40	1.40	1.80	1.60	1.60	23	21	1048	793	570	11	10	10	13	12	12	12	1000			
1.40	1.40	1.80	1.60	1.60	24	22	1147	882	636	11	9	9	13	11	11	11	1000			
1.40	1.40	1.80	1.60	1.60	24	22	1197	931	685	10	9	9	12	11	11	11	1000			
1.40	1.40	2.00	1.60	1.60	25	23	1243	960	740	10	9	9	12	11	11	11	1000			
1.40	1.40	2.00	1.60	1.60	26	24	1315	1021	780	10	8	8	11	10	10	10	1000			
1.40	1.40	2.00	1.60	1.60	28	27	1507	1194	910	9	8	8	11	10	10	10	1000			
1.40	1.40	2.00	1.60	1.60	28	27	1532	1219	935	9	8	8	10	9	9	9	1000			
1.40	1.40	2.00	1.60	1.60	28	27	1605	1274	991	9	8	8	10	9	9	9	1000			
1.40	1.40	2.00	1.60	1.60	29	28	1697	1332	1052	9	7	7	10	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	29	28	1725	1359	1080	9	7	7	10	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	30	29	1802	1444	1142	9	7	7	10	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	30	29	1832	1473	1172	8	7	7	9	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	31	30	1902	1533	1210	8	7	7	9	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	31	30	1927	1558	1235	8	7	7	9	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	31	30	1951	1583	1260	8	7	7	9	8	8	8	1000			
1.40	1.40	2.00	1.60	1.60	31	30	1969	1601	1278	8	7	7	9	8	8	8	1000			
1.56	1.40	2.00	1.60	1.60	33	31	2118	1712	1367	8	7	7	9	8	8	8	1000			
1.56	1.56	2.00	1.60	1.60	31	30	2120	1750	1401	8	6	6	8	8	8	8	1000			
1.56	1.56	2.00	1.60	1.60	35	34	2313	1888	1497	8	6	6	8	8	8	8	1000			
1.56	1.56	2.00	1.60	1.60	35	34	2435	1993	1603	7	6	6	8	7	7	7	1000			
1.56	1.56	2.20	2.00	2.00	37	35	2803	2129	1753	7	6	6	8	7	7	7	1000			
1.56	1.56	2.20	2.00	2.00	37	35	2853	2179	1803	7	6	6	8	7	7	7	1000			
1.56	1.56	2.20	2.00	2.00	38	36	2971	2269	1871	7	6	6	8	7	7	7	1000			
1.56	1.56	2.20	2.00	2.00	39	37	3127	2397	2003	7	6	6	8	7	7	7	1000			

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. _ _



TABLE 16 - CONTROL CABLES

PVC INSULATED CABLE

2.5 sqmm Multicore Control PVC Insulated Cables according to IS 1554-1

Nominal Outer sheath Thickness	Round wire dia	Approximate Overall Diameter			Nett Weight of Cable			Current Ratings (TYPE "A" 70°C PVC)						Current Ratings (TYPE "C" HR 85°C PVC)			Standard Drum Length			
		Round wire armoured	Flat strip armoured	Un-armoured	Round wire armoured	Flat strip armoured	Un-armoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	Amps	Amps	Amps	In Ground (30°C)	In Duct (30°C)	In Air (40°C)		Amps	Amps	Amps
Un-armoured	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps	mtrs
1.80	1.40	15	-	13	471	-	235	32	27	27	27	32	27	27	27	37	31	32	32	1000
1.80	1.40	16	-	14	520	-	272	27	24	24	24	27	24	24	24	31	28	29	29	1000
1.80	1.40	17	-	15	596	-	323	27	24	24	24	27	24	24	24	31	28	29	29	1000
1.80	1.40	18	-	16	662	-	363	27	24	24	24	27	24	24	24	31	28	29	29	1000
1.80	1.40	19	-	17	748	-	425	21	18	18	18	21	18	18	18	24	22	22	22	1000
1.80	1.40	19	-	17	765	-	443	20	17	17	17	20	17	17	17	23	20	20	20	1000
1.80	1.40	21	-	19	873	-	497	19	16	16	16	19	16	16	16	22	19	19	19	1000
1.80	1.60	22	21	20	1021	783	559	18	15	15	15	18	15	15	15	21	18	18	18	1000
1.80	1.60	24	23	21	1115	849	603	18	15	15	15	18	15	15	15	21	18	18	18	1000
2.00	1.60	24	23	22	1213	929	709	17	14	14	14	17	14	14	14	20	17	17	17	1000
2.00	1.60	25	24	24	1335	1042	800	16	14	14	14	16	14	14	14	19	17	17	17	1000
2.00	1.60	26	25	25	1462	1159	895	15	13	13	13	15	13	13	13	18	16	16	16	1000
2.00	1.60	26	25	25	1535	1232	969	14	12	12	12	14	12	12	12	16	14	14	14	1000
2.00	1.60	28	26	26	1610	1272	1013	14	12	12	12	14	12	12	12	16	14	14	14	1000
2.00	1.60	29	28	27	1696	1348	1067	13	11	11	11	13	11	11	11	15	13	13	13	1000
2.00	1.60	32	30	30	1986	1573	1251	13	11	11	11	13	11	11	11	15	13	13	13	1000
2.00	1.60	32	30	30	2023	1610	1288	13	11	11	11	13	11	11	11	15	13	13	13	1000
2.00	1.60	33	31	30	2122	1715	1371	12	10	10	10	12	10	10	10	14	12	12	12	1000
2.00	1.60	33	32	31	2241	1827	1458	12	10	10	10	12	10	10	10	14	12	12	12	1000
2.00	1.60	34	32	31	2282	1868	1499	12	10	10	10	12	10	10	10	14	12	12	12	1000
2.00	1.60	35	33	32	2403	1979	1587	12	10	10	10	12	10	10	10	14	12	12	12	1000
2.00	1.60	35	33	32	2446	2022	1630	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	37	35	34	2770	2097	1720	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	37	35	34	2807	2134	1757	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	37	35	34	2844	2171	1794	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	37	35	34	2871	2198	1821	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	38	36	35	3051	2349	1951	11	9	9	9	11	9	9	9	13	11	11	11	1000
2.20	2.00	37	35	34	3055	2382	2005	10	9	9	9	10	9	9	9	12	11	11	11	1000
2.20	2.00	41	39	38	3312	2551	2138	10	9	9	9	10	9	9	9	12	11	11	11	1000
2.20	2.00	41	39	39	3493	2730	2294	10	9	9	9	10	9	9	9	12	11	11	11	1000
2.20	2.00	42	40	40	3710	2918	2460	10	8	8	8	10	8	8	8	11	10	10	10	1000
2.20	2.00	43	40	40	3820	2992	2534	10	8	8	8	10	8	8	8	11	10	10	10	1000
2.20	2.00	44	41	41	3942	3084	2630	9	8	8	8	9	8	8	8	11	10	10	10	1000
2.20	2.00	45	42	42	4186	3298	2823	9	8	8	8	9	8	8	8	11	10	10	10	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. _ _ _



TABLE 17 - Standard Drum Length For 1.1kV PVC Copper Power Cables

1.5sqmm Multicore Control PVC Insulated Cables according to IS 1554-1

Conductor cross sectional Area	Unarmoured Cables					Armoured Cables				
	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
sqmm	STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE					STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE				
1.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
16	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
25	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
35	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
70	1000	1000	1000	1000	1000	1000	1000	1000	1000	500
95	1000	1000	1000	1000	500	1000	1000	1000	500	500
120	1000	1000	1000	500	500	1000	1000	500	500	500
150	1000	1000	500	500	500	1000	500	500	500	500
185	1000	500	500	500	500	1000	500	500	500	400
240	1000	500	500	500	250	1000	500	500	400	250
300	1000	500	500	250	250	1000	500	250	250	250
400	1000	500	250	250	250	500	400	250	250	250
500	500	400	250	250	250	500	250	250	250	250
630	500	250	250	250	250	500	250	250	250	250
800	500					500				
1000	400					400				

Note : For multicore copper cables above 400sqmm steel drum required.

TABLE 18 - Standard Drum Length For 1.1kV PVC Aluminium Power Cables

Conductor cross sectional Area	Unarmoured Cables					Armoured Cables				
	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
sqmm	STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE					STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE				
1.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
16	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
25	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
35	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
70	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
95	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
120	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
150	1000	1000	1000	1000	1000	1000	1000	1000	500	500
185	1000	1000	1000	1000	500	1000	1000	500	500	500
240	1000	1000	1000	500	500	1000	500	500	500	500
300	1000	500	500	500	500	1000	500	500	500	500
400	1000	500	500	500	500	1000	500	500	500	500
500	1000	500	500	500	500	1000	500	500	250	250
630	500	500	500	500	500	500	500	250	250	250
800	500					500				
1000	500					500				



TABLE-1A

XLPE INSULATED CABLE

Technical Data for Class-2 conductor as per IS: 8130 - 1984

Conductor cross sectional Area (Note 1)	Minimum No of wires				Maximum D.C. Resistance			Maximum A.C. Resistance		
	Non Compacted		Compacted		@ 20 deg. C			@ 90 deg. C		
	Circular		(Circular / Shaped)		Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium
sq.mm	CU	AL	CU	AL	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
1.50	3	3	-	-	12.10	12.20	18.10	14.50	14.63	21.70
2.50	3	3	-	-	7.41	7.56	12.10	8.90	9.09	14.50
4	7	3	-	-	4.61	4.70	7.41	5.52	5.63	8.90
6	7	3	-	-	3.08	3.11	4.61	3.69	3.73	5.54
10	7	7	6	-	1.83	1.84	3.08	2.19	2.20	3.70
16	7	7	6	6	1.15	1.16	1.91	1.38	1.39	2.30
25	7	7	6	6	0.727	0.734	1.20	0.87	0.88	1.44
35	7	7	6	6	0.524	0.529	0.868	0.63	0.64	1.04
50	19	19	6	6	0.387	0.391	0.641	0.464	0.469	0.770
70	19	19	12	12	0.286	0.270	0.443	0.321	0.301	0.533
95	19	19	15	15	0.193	0.195	0.32	0.232	0.235	0.385
120	37	37	18	15	0.153	0.154	0.253	0.184	0.185	0.305
150	37	37	18	15	0.124	0.126	0.206	0.150	0.153	0.249
185	37	37	30	30	0.0991	0.100	0.164	0.121	0.122	0.198
240	61	37	34	30	0.0754	0.0762	0.1250	0.0930	0.0940	0.1520
300	61	61	34	30	0.0601	0.0607	0.1000	0.0750	0.0758	0.1220
400	61	61	53	53	0.0470	0.0475	0.0778	0.0604	0.0610	0.0961
500	61	61	53	53	0.0366	0.0369	0.0605	0.0490	0.0494	0.0761
630	91	91	53	53	0.0283	0.0286	0.0469	0.0401	0.0405	0.0606
800	91	91	53	53	0.0221	0.0224	0.0367	0.0339	0.0343	0.0495
1000	91	91	53	53	0.0176	0.0177	0.0291	0.0297	0.0298	0.0416

Note 1 : Conductors of 1.5sq.mm to 10sq.mm can be manufactured as per class-1 solid conductor as per IS 8130.

TABLE-1B

Technical Data for Class-5 Flexible Copper conductor as per IS: 8130 - 1984

Conductor cross sectional Area	Maximum dia of individual strand in conductor	Maximum D.C. Resistance		Maximum A.C. Resistance	
		@ 20 deg. C		@ 90 deg. C	
		Plain Copper	Tinned Copper	Plain Copper	Tinned Copper
sq.mm	mm	ohm/km	ohm/km	ohm/km	ohm/km
0.50	0.21	39.00	40.10	49.76	51.16
0.75	0.21	26.00	26.70	33.18	34.07
1.00	0.21	19.50	20.00	24.89	25.53
1.50	0.26	13.30	13.70	16.03	16.54
2.50	0.26	7.98	8.21	9.63	9.92
4	0.31	4.95	5.09	5.95	6.13
6	0.31	3.30	3.39	3.97	4.09
10	0.41	1.91	1.95	2.29	2.34
16	0.41	1.21	1.24	1.46	1.49
25	0.41	0.780	0.795	0.9376	0.9567
35	0.41	0.554	0.565	0.6683	0.6823
50	0.41	0.386	0.393	0.4627	0.4717
70	0.51	0.272	0.277	0.3032	0.3095
95	0.51	0.206	0.210	0.2486	0.2537
120	0.51	0.161	0.164	0.1942	0.1980
150	0.51	0.129	0.132	0.1564	0.1602
185	0.51	0.106	0.108	0.1298	0.1323
240	0.51	0.0801	0.0817	0.0990	0.1010
300	0.51	0.0641	0.0654	0.0801	0.0818
400	0.51	0.0486	0.0495	0.0624	0.0636
500	0.61	0.0384	0.0391	0.0513	0.0522
630	0.61	0.0287	0.0292	0.0406	0.0412



TABLE 2 - CAPACITANCE

1.1kV XLPE INSULATED CABLES - APPROXIMATE CAPACITANCE (microfarads/km)

Nominal Conductor cross sectional Area sq.mm	Single Core		Two Core	Multicore (More than Two Cores)
	Unarmoured	Armoured		
1.5	0.189	-	0.064	0.161
2.5	0.229	-	0.071	0.191
4	0.300	-	0.081	0.244
6	0.354	-	0.087	0.283
10	0.441	-	0.096	0.347
16	0.515	0.371	0.100	0.401
25	0.512	0.391	0.105	0.406
35	0.592	0.450	0.111	0.464
50	0.598	0.483	0.115	0.479
70	0.624	0.512	0.117	0.490
95	0.723	0.592	0.122	0.564
120	0.774	0.641	0.127	0.605
150	0.734	0.607	0.126	0.569
185	0.712	0.617	0.127	0.563
240	0.763	0.665	0.130	0.594
300	0.790	0.693	0.130	0.616
400	0.839	0.705	0.132	0.649
500	0.857	0.707	0.133	0.666
630	0.917	0.766	0.137	0.714
800	0.946	0.778	-	-
1000	0.965	0.803	-	-

TABLE 3 - REACTANCE

1.1kV XLPE INSULATED CABLES - APPROXIMATE REACTANCE (ohms/km)

Conductor cross sectional Area (sqmm)	Single Core		Multicore
	Unarmoured	Armoured	
1.5	0.120	-	0.108
2.5	0.113	-	0.1007
4	0.107	-	0.0947
6	0.103	-	0.0902
10	0.098	-	0.0852
16	0.094	0.101	0.0815
25	0.095	0.100	0.0816
35	0.092	0.097	0.0794
50	0.092	0.096	0.0792
70	0.088	0.091	0.0752
95	0.086	0.089	0.0734
120	0.086	0.0879	0.0726
150	0.086	0.0886	0.0732
185	0.086	0.0875	0.0727
240	0.085	0.0866	0.0719
300	0.084	0.0857	0.0711
400	0.084	0.0855	0.0705
500	0.083	0.0851	0.0703
630	0.083	0.0843	0.0697
800	0.083	0.0841	-
1000	0.082	0.0836	-



TABLE 4 A- IMPEDANCE for COPPER CONDUCTOR CABLES

XLPE INSULATED CABLE

1.1kV XLPE INSULATED CABLES - APPROXIMATE IMPEDANCE (ohms/km)

Conductor cross sectional Area (sqmm)	Single Core @ 90 deg. C		Multicore @ 90 deg. C
	Unarmoured	Armoured	
1.50	15.5005	-	15.5004
2.50	9.4807	-	9.4805
4	5.9010	-	5.9008
6	3.9413	-	3.9410
10	2.3421	-	2.3416
16	1.4730	1.4735	1.4723
25	0.9348	0.9353	0.9336
35	0.6773	0.6780	0.6757
50	0.5035	0.5041	0.5013
70	0.3542	0.3549	0.3511
95	0.2617	0.2625	0.2577
120	0.2139	0.2148	0.2090
150	0.1809	0.1820	0.1750
185	0.1533	0.1542	0.1463
240	0.1286	0.1297	0.1204
300	0.1141	0.1151	0.1048
400	0.1031	0.1045	0.0927
500	0.0957	0.0971	0.0845
630	0.0904	0.0917	0.0785
800	0.0873	0.0888	-
1000	0.0853	0.0866	-

TABLE 5 A- VOLTAGE DROP for COPPER CONDUCTOR CABLES

1.1kV XLPE INSULATED CABLES - APPROXIMATE VOLTAGE DROP (mV/A/m)

Conductor cross sectional Area (sqmm)	Single Core @ 90 deg. C		3 Phase @ 90 deg. C
	Unarmoured	Armoured	
1.50	31.0009	-	26.8156
2.50	18.9614	-	16.4013
4	11.8020	-	10.2083
6	7.8827	-	6.8180
10	4.6841	-	4.0509
16	2.9461	2.9469	2.5470
25	1.8696	1.8706	1.6151
35	1.3546	1.3559	1.1689
50	1.0070	1.0083	0.8673
70	0.7083	0.7097	0.6075
95	0.5234	0.5250	0.4458
120	0.4279	0.4296	0.3616
150	0.3618	0.3640	0.3028
185	0.3065	0.3085	0.2532
240	0.2573	0.2593	0.2082
300	0.2282	0.2302	0.1812
400	0.2061	0.2091	0.1604
500	0.1914	0.1942	0.1461
630	0.1808	0.1834	0.1359
800	0.1746	0.1775	-
1000	0.1706	0.1732	-

TABLE 6 - SHORT CIRCUIT CURRENT RATINGS

1.1kV XLPE INSULATED CABLES - Short Circuit Ratings for 1 second

Conductor cross sectional Area (sqmm)	XLPE Insulated (for 90 deg. C)	
	Copper	Aluminium
1.50	0.215	0.14172
2.50	0.358	0.2362
4	0.572	0.37792
6	0.858	0.56688
10	1.431	0.9448
16	2.289	1.51168
25	3.577	2.362
35	5.008	3.3068
50	7.154	4.724
70	10.016	6.6136
95	13.593	8.9756
120	17.170	11.3376
150	21.462	14.172
185	26.470	17.4788
240	34.339	22.6752
300	42.924	28.344
400	57.232	37.792
500	71.540	47.24
630	90.140	59.5224
800	114.464	75.584
1000	143.080	94.48



TABLE 7 - CURRENT RATINGS

Current Ratings for 2 Single Core Unarmoured / Armoured XLPE Insulated Cables

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.		Direct in Duct (30 deg. C) Amp.		Direct in Air (40 deg. C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	32	26	27	22	28	22
2.50	42	32	36	28	37	28
4	54	43	46	36	48	38
6	67	55	57	47	61	50
10	90	69	76	58	83	64
16	115	89	97	75	108	84
25	148	115	124	96	144	112
35	177	137	148	115	176	137
50	208	161	174	135	212	165
70	255	198	213	165	269	209
95	312	243	256	199	340	264
120	355	276	291	226	396	308
150	396	308	324	252	450	350
185	447	349	365	285	519	406
240	515	404	420	329	613	480
300	576	454	469	369	700	551
400	651	518	528	421	813	647
500	727	588	589	476	930	751
630	806	663	651	536	1056	868
800	877	740	707	596	1179	992
1000	935	812	751	652	1288	1117

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given.

TABLE 8 - CURRENT RATINGS

Current Ratings for 3 Single Core Unarmoured / Armoured XLPE Insulated Cables

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.		Direct in Duct (30 deg. C) Amp.		Direct in Air (40 deg. C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	28	23	26	21	24	19
2.50	36	28	33	26	31	24
4	47	37	43	34	41	33
6	58	47	53	43	52	43
10	77	59	70	54	71	55
16	98	76	89	69	94	72
25	126	98	114	89	126	98
35	150	116	136	106	154	119
50	177	137	160	124	187	145
70	216	168	195	151	238	185
95	260	202	233	181	303	235
120	295	230	264	206	354	276
150	329	256	294	229	403	314
185	371	290	330	258	468	366
240	427	335	379	298	553	434
300	477	376	422	333	634	500
400	537	429	473	378	737	589
500	598	485	525	426	844	685
630	661	546	578	477	961	793
800	721	608	626	528	1077	907
1000	772	665	668	575	1188	1022



TABLE 9 - CURRENT RATINGS

XLPE INSULATED CABLE

Current Ratings for Two Cores Unarmoured / Armoured XLPE Insulated Cables

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.		Direct in Duct (30 deg. C) Amp.		Direct in Air (40 deg. C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
sqmm						
1.50	31	26	27	22	27	22
2.50	41	32	35	27	36	28
4	54	42	45	36	48	38
6	67	55	56	46	61	50
10	89	68	75	57	83	64
16	115	89	96	74	108	83
25	147	114	122	95	140	109
35	176	136	146	113	172	133
50	208	161	173	134	208	162
70	253	197	211	164	262	204
95	302	235	252	196	322	251
120	340	266	284	222	368	287
150	379	296	317	248	419	328
185	425	335	357	281	482	379
240	486	385	409	324	566	448
300	541	432	456	364	644	513
400	602	487	508	412	734	593
500	665	548	562	463	831	683
630	728	612	616	518	936	784

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given.

TABLE 10 - CURRENT RATINGS

Current Ratings for Three, Three & Half, Four, Five Cores Unarmoured / Armoured XLPE Insulated Cables

Conductor cross sectional Area	Direct in Ground (30 deg. C) Amp.		Direct in Duct (30 deg. C) Amp.		Direct in Air (40 deg. C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
sqmm						
1.50	26	22	22	18	23	19
2.50	34	27	29	23	30	24
4	45	35	38	30	41	32
6	56	46	47	38	52	42
10	74	57	62	48	70	54
16	95	74	79	61	89	69
25	122	95	102	79	119	93
35	146	114	122	94	147	114
50	173	134	144	112	179	138
70	212	164	177	137	226	175
95	254	197	212	164	279	216
120	287	223	240	187	320	249
150	321	249	269	209	365	284
185	362	282	304	238	422	329
240	418	327	352	276	500	392
300	469	369	396	312	574	452
400	528	420	447	356	662	526
500	593	478	511	412	760	612
630	661	542	571	468	870	712

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given.



TABLE 11 - THICKNESSES

Insulation, Innersheath, Outersheath Thicknesses of XLPE Insulated Cables according to IS 7098-1

Conductor cross sectional Area	Nominal Insulation Thickness		Minimum Innersheath Thickness				Minimum Outersheath Thickness (Flat strip armoured cable)					Minimum Outersheath Thickness (Round wire armoured cable)			
	Single Core Armoured	Multicore & Single Core Unarmoured	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core
sqmm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-
2.50	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-
4	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-
6	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-
10	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-
16	1.00	0.70	0.30	0.30	-	0.30	-	-	1.24	-	1.40	1.24	1.40	1.40	-
25	1.20	0.90	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40
35	1.20	0.90	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40
50	1.30	1.00	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.56	1.24	1.40	1.56	1.56
70	1.40	1.10	0.30	0.40	0.40	0.40	-	1.56	1.56	1.56	1.56	1.24	1.56	1.56	1.56
95	1.40	1.10	0.40	0.40	0.40	0.40	1.40	1.56	1.56	1.56	1.56	1.40	1.56	1.56	1.56
120	1.50	1.20	0.40	0.40	0.40	0.50	1.40	1.56	1.56	1.72	1.72	1.40	1.56	1.72	1.72
150	1.70	1.40	0.40	0.50	0.50	0.50	1.40	1.72	1.72	1.72	1.88	1.40	1.72	1.88	1.88
185	1.90	1.60	0.50	0.50	0.50	0.50	1.40	1.72	1.88	1.88	2.04	1.40	1.88	2.04	2.04
240	2.00	1.70	0.50	0.60	0.60	0.60	1.40	1.88	2.04	2.04	2.20	1.40	2.04	2.20	2.20
300	2.10	1.80	0.60	0.60	0.60	0.70	1.56	2.04	2.20	2.20	2.36	1.56	2.20	2.36	2.36
400	2.40	2.00	0.60	0.70	0.70	0.70	1.56	2.36	2.52	2.52	2.68	1.56	2.36	2.68	2.68
500	2.60	2.20	0.70	0.70	0.70	0.70	1.56	2.52	2.68	2.68	2.84	1.56	2.68	2.84	2.84
630	2.80	2.40	0.70	0.70	0.70	0.70	1.72	2.68	2.84	3.00	3.00	1.72	2.84	3.00	3.00
800	3.10	2.60	-	-	-	-	1.72	-	-	-	-	1.88	-	-	-
1000	3.30	2.80	-	-	-	-	1.88	-	-	-	-	2.04	-	-	-

TABLE 15 - CONTROL CABLES

1.5sqmm Multicore Control XLPE Insulated Cables according to IS 7098-1

Number of Cores	Minimum Inner sheath Thickness	Minimum Outer sheath Thickness		Nominal Outer sheath Thickness	Round wire dia	Approximate Overall Diameter			Nett Weight of Cable			Current Ratings (TYPE "XLPE" 90°C PVC)			Standard Drum Length
		Round wire armoured	Flat strip armoured	Un-armoured		Round wire armoured	Flat strip armoured	Un-armoured	Round wire armoured	Flat strip armoured	Un-armoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	
		mm	mm	mm		mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	
5	0.30	1.24	-	1.80	1.40	16	-	15	481	-	279	25	20	22	1000
6	0.30	1.24	-	1.80	1.40	17	-	16	542	-	323	22	19	19	1000
7	0.30	1.24	-	1.80	1.40	17	-	16	550	-	334	21	20	18	1000
8	0.30	1.24	-	1.80	1.40	18	-	17	610	-	373	20	17	18	1000
9	0.30	1.24	-	1.80	1.40	18	-	18	672	-	418	19	16	17	1000
10	0.30	1.24	-	1.80	1.40	20	-	19	719	-	451	18	15	16	1000
12	0.30	1.24	1.24	1.80	1.60	20	20	19	776	690	507	17	14	15	1000
14	0.30	1.40	1.40	1.80	1.60	21	21	20	869	793	570	16	13	14	1000
16	0.30	1.40	1.40	1.80	1.60	23	22	21	1013	882	636	16	13	14	1000
19	0.30	1.40	1.40	2.00	1.60	24	23	23	1111	960	740	15	12	13	1000
24	0.30	1.40	1.40	2.00	1.60	26	27	26	1328	1194	910	13	11	12	1000
27	0.30	1.40	1.40	2.00	1.60	27	27	26	1410	1274	991	13	11	11	1000
30	0.30	1.40	1.40	2.00	1.60	28	28	27	1497	1359	1080	12	10	11	1000
33	0.30	1.40	1.40	2.00	1.60	29	29	28	1603	1473	1172	12	9	10	1000
37	0.30	1.40	1.40	2.00	1.60	30	30	29	1720	1601	1278	11	9	10	1000
44	0.30	1.56	1.56	2.00	1.60	33	34	33	2005	1888	1497	11	8	9	1000
48	0.30	1.56	1.56	2.00	1.60	34	34	33	2106	1993	1603	11	8	9	1000
52	0.30	1.56	1.56	2.20	2.00	34	35	34	2230	2129	1753	10	8	9	1000
56	0.30	1.56	1.56	2.20	2.00	35	36	35	2340	2269	1871	10	8	9	1000
61	0.40	1.56	1.56	2.20	2.00	37	37	36	2700	2397	2003	9	8	8	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. ---



TABLE 11 - THICKNESSES

XLPE INSULATED CABLE

Insulation, Innersheath, Outersheath Thicknesses of XLPE Insulated Cables according to IS 7098-1

Number of Cores	Minimum Inner sheath Thickness	Minimum Outer sheath Thickness			Nominal Outer sheath Thickness	Round wire dia	Approximate Overall Diameter			Nett Weight of Cable			Current Ratings (TYPE "A" 70°C PVC)			Standard Drum Length
		Round wire armoured	Flat strip armoured	Un-armoured			Round wire armoured	Flat strip armoured	Un-armoured	Round wire armoured	Flat strip armoured	Un-armoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	
5	0.30	1.24	-	1.80	1.40	18	-	16	662	-	363	34	28	30	1000	
6	0.30	1.24	-	1.80	1.40	19	-	17	748	-	425	29	24	26	1000	
7	0.30	1.24	-	1.80	1.40	19	-	17	765	-	443	27	23	25	1000	
8	0.30	1.40	-	1.80	1.40	21	-	19	873	-	497	26	22	24	1000	
9	0.30	1.40	1.40	1.80	1.60	22	21	20	1021	783	559	25	21	22	1000	
10	0.30	1.40	1.40	1.80	1.60	24	23	21	1115	849	603	24	20	21	1000	
12	0.30	1.40	1.40	2.00	1.60	24	23	22	1213	929	709	22	19	20	1000	
14	0.30	1.40	1.40	2.00	1.60	25	24	24	1335	1042	800	21	18	19	1000	
16	0.30	1.40	1.40	2.00	1.60	26	25	25	1462	1159	895	20	17	18	1000	
19	0.30	1.40	1.40	2.00	1.60	28	26	26	1610	1272	1013	19	16	17	1000	
24	0.30	1.56	1.40	2.00	1.60	32	30	30	1986	1573	1251	17	15	16	1000	
27	0.30	1.56	1.40	2.00	1.60	33	31	30	2122	1715	1371	16	15	16	1000	
30	0.30	1.56	1.56	2.00	1.60	34	32	31	2282	1868	1499	16	13	14	1000	
33	0.30	1.56	1.56	2.00	1.60	35	33	32	2446	2022	1630	15	13	14	1000	
37	0.40	1.56	1.56	2.20	2.00	37	35	34	2871	2198	1821	15	12	13	1000	
44	0.40	1.56	1.56	2.20	2.00	41	39	38	3312	2551	2138	14	11	12	1000	
48	0.40	1.56	1.56	2.20	2.00	41	39	39	3493	2730	2294	14	11	12	1000	
52	0.40	1.56	1.56	2.20	2.00	42	40	40	3710	2918	2460	13	11	12	1000	
56	0.40	1.72	1.56	2.20	2.00	44	41	41	3942	3084	2630	13	11	11	1000	
61	0.40	1.72	1.56	2.20	2.00	45	42	42	4186	3298	2823	12	10	11	1000	

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no....





IS: 694: 2010 TABLE-1

PVC INSULATED, SOLID AND STRANDED ALUMINIUM/COPPER CONDUCTOR
SINGLE CORE UNSHEATHED CABLES FOR FIXED INSTALLATION WORKING
VOLTAGE UPTO & INCLUDING 1100V CONFORMING TO IS: 694: 2010

Nominal Cross Sectional Area Sq. mm.	No. and Size of Wires (*) In mm.	Max. DC CONDUCTOR Resistance at 20 deg. C		CURRENT RATING BUNCHED & ENCLOSED IN CONDUIT OR TRUNKING 2 CABLES, SINGLE PHASE Ac or DC in Amp.		Thickness of Insulation (Nominal) Min. # mm.	Max. Overall Diameter in mm.
		Aluminium	Copper	Aluminium	Copper		
1	1/1.13	----	18.1	----	11	0.7	3.2
1.5	1/1.38	18.1	12.1	12	13	0.7	3.4
1.5	3/0.80	18.1	12.1	12	13	0.8	3.4
2.5	1/1.78	12.1	7.41	17	18	0.8	4.2
2.5	3/1.04	12.1	7.41	17	18	0.8	4.2
4	1/2.25	7.41	4.61	23	24	0.8	4.8
4	7/0.85	7.41	4.61	23	24	0.8	4.8
6	1/2.76	4.61	3.08	29	31	0.8	5.6
6	7/1.04	4.61	3.08	29	31	0.8	5.6
10	1/3.57	3.08	----	40	42	1	7
10	7/1.35	3.08	1.83	40	42	1	7
16	7/1.70	1.91	1.15	54	57	1	8.2
25	7/2.14	1.2	0.727	69	71	1.2	10
35	7/2.52	0.868	0.524	83	91	1.2	11.5
50	19/1.82	0.641	0.387	105	120	1.4	13

(*) - Class 1 & 2 of IS: 8130: 84 (#) - Type A of IS: 5831:84 *Above Single Core Unsheathed Cables can be manufactured with FRLS PVC/FRHF Compound Insulation

IS: 694: 2010 TABLE-2

PVC INSULATED SINGLE CORE UNSHEATHED WITH HIGH CONDUCTIVITY BRIGHT ANNEALED
COPPER CONDUCTOR FOR WORKING VOLTAGE UPTO & INCLUDING 1.1 KV CONFORMING TO IS: 694:2010.

NOMINAL AREA OF CONDUCTOR (*)	NUMBER & DIAMETER OF STRANDS	THICKNESS OF INSULATION (NOMINAL) (#)	APPROXIMATE OVERALL DIAMETER	CURRENT CARRYING CAPACITY, 2 CABLES SINGLE PHASE		MAX. DC CONDUCTOR RESISTANCE At 20°C
				IN CONDUIT/ TRUNKING	UNENCLOSED CLIPPED DIRECT TO SURFACE OR ON A CABLE TRAY	
Sq. MM.	MM.	MM.	MM.	AMP.	AMP.	OHM/KM
1.0	14/0.3	0.7	2.75	11	12	18.10
1.5	22/0.3	0.7	3.00	13	16	12.10
2.5	36/0.3	0.8	3.70	18	22	7.41
4.0	56/0.3	0.8	4.30	24	29	4.95
6.0	84/0.3	0.8	5.00	31	37	3.30



IS: 694: 2010 TABLE-3

SINGLE CORE/MULTICORE FLEXIBLE CABLES CONFORMING
TO IS: 694:2010 VOLTAGE GRADE UPTO & INCLUDING 1100 VOLTS

CONDUCTOR	AREA (Sq.mm.)	0.5	0.75	1	1.5	2.5	4	6	10	16	25	35	50
	No. & Size of Wire (mm)	16/0.2	24/0.2	32/0.2 or 14/.03	48/0.2 or 30/0.25	80/0.2 or 50/0.25	128/0.2 or 56/0.3	84/0.3	140/.3	126/0.4 or 226/0.3	196/0.4 or 354/0.3	276/0.4 or 495/0.3	396/0.4 or 707/0.3
	Max. Resistance At 20 C Ohm/Km	39	26	19.55	13.3	7.98	4.95	3.3	1.91	1.21	0.78	0.554	0.386
	Current Rating Dc 1\$ or AC 3\$	4	7	12	15	20	27	35	45	62	80	102	138
INSULATION	Thickness Nominal (mm.)	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8	1	1.2	1.2	1.4
SINGLE CORE UNSHEATHED	Overall Diameter (mm.) Approximate	2.2	2.4	2.5	2.9	3.6	4.3	5.1	6.6	7.8	9.8	10.8	13
TWO CORE	Sheath Thickness (mm.) Nominal	0.9	0.9	0.9	0.9	1	1						
	Overall Diameter (mm.) Approximate	6.2	6.6	6.8	7.6	9.2	10.6						
THREE CORE	Sheath Thickness (mm.) Nominal	0.9	0.9	0.9	0.9	1	1						
	Overall Diameter (mm.) Approximate	6.6	7	7.2	7.9	9.6	11.1						
FOUR CORE	Sheath Thickness (mm.) Nominal	0.9	0.9	0.9	1	1	1						
	Overall Diameter (mm.) Approximate	7.1	7.6	7.8	8.6	10.4	12.1						
FIVE CORE	Sheath Thickness (mm.) Nominal	0.9	0.9	0.9	1	1	1						
	Overall Diameter (mm.) Approximate	7.8	8.3	8.8	8.6	11.8	13.9						

IS: 694: 2010 TABLE-4

SINGLE CORE FLEXIBLE UNSHEATHED CABLES FOR WORKING VOLTAGE UPTO & INCLUDING 1100 VOLTS AS PER IS: 694:2010

AREA IN SQ. MM	70	95	120	150	185	240	300
NO.& SIZE OF WIRES (MM.)	360/0.5	485/0.5	608/0.5	750/0.5	925/0.5	1221/0.5	1560/0.5
CURRENT RATING (AMP)	214	254	300	340	390	460	510
MAX. COND. RESISTANCE AT 20°C (OHM/KM)	0.272	0.206	0.161	0.129	0.106	0.0801	0.64
INSULATION THICKNESS (MM.) NOMINAL	1.4	1.6	1.6	1.8	2	2.2	2.4
APP. OVERALL DIAMETER (MM.)	16	18.2	20.2	22.5	24.9	28.4	31



ISO CERTIFICATES





PERFORMANCE CERTIFICATES

Toyo Engineering India Private Limited
 CIN: U28990MH1981PTC028473
 Registered Office: Toyo House, L.B.G. Marg,
 Kankarnagar (West), Mumbai-400 076, INDIA
 Tel: +91 22 2673 3300, Fax: +91 22 2673 1538 / 21
 E-mail: to.com@toyoeng.com
 Website: www.toyo-eng.com/india

TO WHOMSOEVER IT MAY CONCERN

Ref PO No.: P0340/157480360 (dtl. 16/03/2017 & AP-01 dtl. 31/07/2017)

This is to certify that M/s. ASSOCIATED CABLES PVT. LTD, 29, Marol Co-op Industrial Estate, Anandhi IEL, Mumbai has successfully completed the supply of Signal, Control, Power & Thermocouple Cables for our Offsite and Utilities (G3OU) Project, Gadgaon, Dist.Kota, Rajasthan-325208 vide our above referred Purchase Order.

They have supplied total quantity of 174,255 kms cables as per our requirement for our G3OU Project with in committed delivery schedule and. The quality and performance of cables supplied by vendor are found satisfactory.

For and on behalf of
TOYO ENGINEERING INDIA PRIVATE LIMITED

Shantanu V. Gurte
SHANTANU V. GURTE
 PROJECT MANAGER
 OFFSITE AND UTILITIES- G3OU

Toyo Technology Centre: T1, Bantar Village Road, Kankarnagar (E), Mumbai-400 046.
 Tel: +91 22 2713 5000, Fax: +91 22 2713 5043
 Delhi Office: 214, Ishratnagar Road, Sector 32/33/34, Connaught Place, Near Apollo Hospital, New Delhi-110021.
 Phone: +91 11 2670 1200, Fax: +91 11 2670 1200, Email: to.delhi@toyo-eng.com

ThyssenKrupp Industries India

ThyssenKrupp Industries India Pvt. Ltd., Plot No. 122, Phase 1, Date: 15.03.2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that: M/s Associated Cables Pvt. Ltd, Mumbai, India has supplied Instrumentation Cables, Total quantity- 67 Kms, against our Purchase Order No. 2500006402 & 2500006403 dated 04/02/2015 for Minergy Power Corporation, Pasig city, Philippines.

We take this opportunity to thank M/s. ACPL for their excellent cooperation & response time with our Projects, Inspection & Logistics department during the execution of this order.

We also wish to appreciate the quality systems adopted by them, during various stages of manufacturing. We find the Testing facilities are very good.

We wish ACPL all the best & would like to strengthen our relationship further for our future projects.

Name: *Vidya Anwar Pankaj Kumar*
 Designation: *Mr. Manoj Kumar*
 Signature with seal

For ThyssenKrupp Industries India Pvt. Ltd.

ThyssenKrupp Industries India Pvt. Ltd.
 Plot No. 122, Phase 1, Pasig City, Philippines
 Phone: +63 2 771 2333, Fax: +63 2 771 2333
 E-mail: india@thyssenkrupp.com
 Website: www.thyssenkrupp.com

Linde Engineering India Private Ltd 'Linde House', Opp. Vaidi Office, VPI Road, NARAINA, DELHI 110028

To Whomsoever It May Concern

M/S ASSOCIATED CABLES PVT.LTD. has successfully completed our purchase order No.002 2JA 6160 dated 12.09.2011 and sup.001 dated 15.11.2011 sup.002 dated 30.11.2011, sup.003 dated 02/04/2012 for Signal, Control & Thermocouple cables for HPLC market Mumbai.

This order is valued at Rs. 3.13 Crores.

The cables have been supplied as per the approved specification within the specified delivery period.

The performance of the above cables are found to be satisfactory.

Amanendra Tiwari
Amanendra Tiwari S-9-9015
 DGM - Procurement
 Date: 05/01/2015

Jagat Thakkar
Jagat Thakkar
 DGM - Projects Execution

Registered Office:
 Linde House, Vaidi Office, VPI Road,
 Naraina, New Delhi-110028
 Phone: +91 11 2610 2000
 Fax: +91 11 2610 2000
 Website: www.linde.com
 Email: india@linde.com

BORSIG 7M COMPRESSION ZM

BORSIG ZM Compression - Selektar Altes 70-09203 Mberon

Associated Cables Pvt. Limited

400 059 Mumbai
 India

Beaufahrer/ Person in Charge: Norman Seifert
Telefon/ Phone: +49 (0)3764 5390-5103
Telefax/ Fax: +49 (0)3764 5390- 5190
Unsere Zeichen/ Our Reference: Se
Abteilung/ Dept.: Sales Department
Unsere Ref.-Nr./Our Reference No.:
E-mail/ E-mail: n.seifert@zm.borsig.de

Ihre Zeichen/Your Reference
Ihre Nachricht vom/Your Letter 16. April 2017

Your work order no. K90057
Our order no.: 2006-2113187

Order: Supplying of control & instrumentation cables

SUPPLY CERTIFICATE

We, Borsig ZM compression GmbH, herewith state that we were satisfied with the proposal, the execution of above mentioned order, the delivery time and the quality of the above mentioned cables.

Best regards

BORSIG ZM Compression GmbH

N. Seifert
 i.A. Seifert
 Project Manager

BORSIG ZM Compression GmbH
 Selektar Altes 70, 09203 Mberon
 Germany
 Telefon/ Phone: +49 3764 5390-5090
 Telefax/ Fax: +49 3764 5390-5090
 E-mail / E-mail: info@zm.borsig.de
 Internet: www.borsig-zm.com



PERFORMANCE CERTIFICATES

HAL OFFSHORE LIMITED
 ONGC, 33 Corporate Avenue, Premium Cooperative Society Ltd., Near Pagar One Industry,
 Sakinaka Village, Off. Mahadev Road, Andheri (East), Mumbai - 400 051.
 Tel: +91-22-4010061/062/063 Fax: +91-22-4010071/0072/0073 Email: info@haloffshore.com

Date: 7th August 2023

TO WHOM SO EVER IT MAY CONCERN

This is to certify that, Associated Cables Private Ltd, Mumbai, India has supplied Instrumentation Cables to ONGC Offshore Projects, vide our following PO's Nos.

Sr. No.	PO Nos.	Qty in Meters	Project
1	HAL/PO/MOL-REIS/R013 DK. 10.11.2016	2500	ONGC Mumbai High Field
2	HAL/PO/PGC-HR/008 DK. 14.11.2016	4590	ONGC Heera Asset Block
3	HAL/PO/WHS-HIEHA/R/013 DL 19.04.2018	5256	ONGC Heera Platform

The Cables are under operation for more than 3 years and the Performance of the cables has so far been Satisfactory.

Yours sincerely,
 For, HAL OFFSHORE LTD.

AUTHORIZED SIGNATORY

National Peroxide Limited
 (INCORPORATED UNDER COMPANIES ACT - 1956/2003 IN INDIA)
 UNIT 10, VADWANI, H. F. ROAD, POST VADWANI, KAJIYA - 421102, MAHARASHTRA.
 Corporate Identification No.: L34290MH1994PL1000254

Date: 25/07/2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, M/s. Associated Cables Pvt. Ltd, Mumbai, India is regularly supplying Signal Transmittable Power & Control Cables to us, since almost 10 years, against our purchase orders & subsequent amendments mentioned below:

OL PO NO.	Qty -	QTY ORDERED (Mtrs.)
250066	08.17.2005	1648
251117	28.12.2005	2000
261649	28.12.2006	70500
261718	28.12.2006	4500
261215	28.12.2006	2000
262051	15.05.2008	3000
234473	15.01.2008	500
271718	13.01.2007	500
28290229	23.10.2011	21800
M1620175	19.07.2015	8000
M1620212	29.07.2016	2000

We take this opportunity to thank M/s. ACPL for their excellent cooperation & assistance provided with our Projects, Inspection & Logistics requirements during the execution of these orders.

We also wish to appreciate the quality systems adopted by them, during various stages of manufacturing. We find the testing facilities very useful.

We will ACPL of the best & would like to strengthen our relationship further for our future projects.

Name: _____
 Designation: _____
 Signature:
 For National Peroxide Limited.

REGISTERED OFFICE
 NCELLE, GURUDEV, H. F. ROAD, VADWANI, KAJIYA - 421102, MAHARASHTRA
 Tel: +91-22-4010061/062/063 Fax: +91-22-4010071/0072/0073 Email: info@haloffshore.com

OIL
 -Delivery Partner-

Date: 17/12/2014

TO WHOMSOEVER IT MAY CONCERN

M/S. ASSOCIATED CABLES PVT. LTD. has successfully completed following orders for our Valued Customers.

Sr. No.	PO No. & Date	Cable Type	Qty (Mtr)	Value (Rs. In Lacs)	Project Location	Consultant
1	OIL-2014-012-145/PO/0675/AND 1-01-23/2014	Signal Cable, Fire Resistance & Fire Retardant	9667	10.52	ONGC, Rewari	Wipro Projects, Mumbai
2	OIL-2014-012-219/PO/0675/AND 1-01-23/2014	Signal Cable, Fire Resistance & Fire Retardant	8825	11.52	ONGC, Bhamburda	Wipro Projects, Mumbai
3	OIL-2014-012-219/PO/0675/AND 1-01-23/2014	Signal & Power Cables	22620	24.87	ONGC, Bikaner	M/s. Maharashtra Mumbai

The above cables were inspected by M/s. Bureau Veritas India Pvt. Ltd, Mumbai. The quality, delivery & performance of the cables found satisfactory.

We also confirm that the quality systems adopted by them are very good.

For Offshore Infrastructure Limited,

OFFSHORE INFRASTRUCTURES LIMITED
 21, Jeevan Kshema, Mahadev Jeevan Road, Andheri (E), Mumbai - 400 052, India

LINDE'S MOST PREFERRED VENDOR

Certificate of Honor
 to
M/s. Associated Cables Pvt. Ltd.

In recognition of your commitment towards quality, in-time delivery and competitiveness, Linde Engineering India Pvt. Ltd. (LEI) is pleased to confer on you the status of **'LINDE'S MOST PREFERRED VENDOR'**, for the period September 2012 to August 2013 under the category - Control Cables (EB06).

We are sure this would take your relationship with Linde to the next level of mutual understanding and collaboration and we also hope it encourages you to impart even better and consistent performance along with overall competitiveness.

Shyamal Dutta
 Director - Global Procurement, Linde India

Linde Engineering India Pvt. Ltd.,
 Linde House, Opp. PDA Office, Kumbhagar, Wakoda's 200/018
 www.linde-india.com



PERFORMANCE CERTIFICATES



**AMTEK
INSTRUMENTS**

TO WHOM IT MAY CONCERN

M/S ASSOCIATED CABLES PVT.LTD. has supplied Instrumentation cables for our various projects as per the following purchase order nos.

- 1) 0029/11-12 Dtd. 30.04.2011
- 2) 0031/11-12 Dtd. 06.07.2011
- 3) 0033/11-12 Dtd. 09.07.2011


Quality and Performance of the cable supplied by M/S ASSOCIATED CABLES PVT.LTD found satisfactory.

For **AM, AMTEK INSTRUMENTS**

Partner

Amtex Instruments
205, Sankar-II Complex, Opp. Reliance Petrol Pump
Above Bank of India, Prahladnagar, Satellite
Ahmedabad - 380 015.

OFFICE : 305, SARANI COMPLEX, OPP. RELIANCE PETROL PUMP, ABOVE BANK OF INDIA, PRAHLADNAGAR, SATELITE, AHMEDABAD-380 015.
TEL, FAX : (91) 79 3897348-49-50, 387776887 E-MAIL : amtex@amtek-instruments.com ; sales@amtek-instruments.com

HEUNTEY PETROCHEM

TO WHOMSOEVER IT MAY CONCERN

M/S ASSOCIATED CABLES PVT LTD has successfully completed our Purchase Order's NI1004M034, NI1003M026 & NI1001M038 Dated 31.03.2011 for various types of cables. They have supplied 9400 Meters worth Rs.6,79,419/-, 1200 Meters worth Rs. 83,880/- and 32200 Meters worth Rs. 27,46,230/- respectively as per tender Wheeler specifications under TUV INDIA PVT.LTD inspection for your project (OCI - Purnesep VCO,DCU & DHD) Amjes.

The quality supplied by the party, delivery and the performance of above cables found to be satisfactory.



We also confirm that the quality control standards adopted by them are very good.

For
Heuntey Petrochem India Pvt. Ltd

Partner

Satish Roy/Amnadar

M/S ASSOCIATED CABLES PVT. LTD.
205, SANKAR-II COMPLEX, OPP. RELIANCE PETROL PUMP, ABOVE BANK OF INDIA, PRAHLADNAGAR, SATELITE, AHMEDABAD-380 015.

TOYO ENGINEERING INDIA LIMITED
TOYO HOUSE, 2A, CHAMBAL CHASTE ROAD, KALIDHARA INDUSTRIAL AREA, HALDA
INDIA - 741001 (INDIA), CONTACT NO. 06749 22001 FAX NO. 06749 22002
E-MAIL: toyo@toyoe.com

June 10 2003

TO WHOMSOEVER IT MAY CONCERN

This is to certify that we have placed various Purchase Orders on M/s. Associated Cables Pvt. Limited since the last 15 years, for supply of "Instrumentation Signal" & Control and Thermocouple cables to our following projects, such as:-

- Chambal Fertilizers & Chemicals Limited - Phase I, Kota
- Margalona Refractories & Refractories Limited, Bangalore
- Haldia Petrochemicals Limited, Haldia
- Chambal Fertilizers & Chemicals Limited - Phase II, Kota
- L&K - Hazira, Hazira

We have found that the quality control systems adopted by M/s. Associated Cables Pvt. Ltd. during various stages of manufacturing and testing of cables are very good.



The overall performance of the supplied cables has been found to be satisfactory.

Yours faithfully,
For Toyo Engineering India Limited

S.M.P. Natak

S.M.P. Natak
Sr. Executive Manager

DC - 1 OFFICE: UNITED COMMERCIAL BANK BLDG., 15TH FLOOR, PARLIAMENT STREET NEW DELHI - 110 001
TEL: 26107550

VIJAY TANKS & VESSELS LTD.
P.O. Box 1294, Sankar, Ahmedabad-380 002, India

13 March, 2000

TO WHOMSOEVER IT MAY CONCERN


This is to certify that M/s. Associated Cables Ltd have supplied 56 Kms of cables for our GAIL, Patk. project worth about 54 lakhs, promptly within the stipulated delivery period and with M/s. IIL inspection. We also confirm that the Quality Control standards adopted by them are very good.

For Vijay Tanks & Vessels Limited,

T.V.R. Ravindra

T.V.R. Ravindra,
Tolal, General Manager.

47, KALIDHARA INDUSTRIAL AREA, HALDA ROAD, HALDA, PIN CODE - 741001, INDIA
TEL: 06749 22001 FAX: 06749 22002 E-MAIL: toyo@toyoe.com





MANUFACTURING FACILITY

The machines installed at ACPL are state-of-the-art, imported machines with PLC controls. The wire drawing machines and buncher are from Niehoff-Germany and Samp-Italy. The Extruder are from Nokia Maillefer - Switzerland, Davis Standard - U.S.A, Reifenhouser - Germany. Pairing machine are from Northampton - UK., and Armouring and Laying machine are from Poutier-France.

The Production facility is backed by well-equipped testing facility with world class Instruments. All these Instruments are periodically calibrated to ensure zero error and adherence to standards. We also manufacture, FR (Fire Retardant), FRLS (Fire Resistant Low Smoke) and LSZH (Low Smoke Zero Halogen) cables for special application.

ACPL CHIPLUN PLANT

Total Area 538,500 sqft. Built up Area 88,944 sqft. Open Area 449,556 sqft.

TYPE OF BUILDING	AREA SQ. FT.	UNDER HOOK HEIGHT
Office	4,170	10 ft
Guest house	5,041	12 ft
Factory Building Hall 'A'	22,536	16 ft
Factory Building Hall 'B'	39,679	16 ft
Laboratory	2,525	13.5 ft
Hall 'C' (Raw material & Finished goods)	12,493	16 ft
Waste Products Store	2,500	12 ft



LIST OF PLANT & MACHINERIES

Sr.No.	MACHINE DESCRIPTION	MAKE
1	RBD	SAMP
2	16 Wire Drawing Machine	Niehoff
3	ASA Wire Drawing Machine	ASA Machines
4	Fine Wire Drawing Machine	Niehoff
5	Tinning Machine	Cab Device, Delhi
6	Bunching Machine - 4 Nos	SAMP
7	Bunching Machine	Cortinovis
8	Bunching Machine (Cortinovis)	Cortinovis
9	Bunching Machine	Niehoff
10	Bunching Machine	Niehoff (asa India)
11	80+45 - mm Extruder	Supermac
12	90 mm - Davis Standard Extruder	Davis Standard
13	(70+30) Insulation Extruder	Wai Tak Lung China
14	Pairing Machine - 2 Nos	Niehoff
15	Twisting (pairing) Machine	Northampton
16	Twisting (pairing) Machine	Northampton
17	Pourtier Laying Machine	Pourtier France
18	DTS 1250 Laying Machine	Machino Technik, Thane
19	Horizontal Armouring Machine	Inhouse Fabricated
20	Vertical Armouring Machine	Inhouse Fabricated
21	54 Bobbin Armouring Machine	Mpi Machines Ltd., Gwalior
22	120 - mm Extruder	Maillefer
23	100 - mm Reifenhausser Extruder	Reifenhausser
24	Mica Taping Machine - 2 Head	Shanghai Nan Yang Ele. Co. Ltd.
25	Mica Taping Machine - 3 Head	Gemwell Electrical Machinery
26	Rewinding Line With Dual Taping Head	REA



LIST OF TESTING EQUIPMENT

Sr. No.	Name of Testing Equipments	Measuring range of Equipment	Accuracy
1	High Resistance meter	10 MΩ - 100 GΩ	± 5 %
2	LCR meter	10Mohms, 100henry, 1000mfarads	R, L: ± 0.2%, C: ± 0.3%
3	Tensile testing machine	0.5 KN & 5.0 KN	± 1 %
4	HCL gas emission test apparatus	0 - 1000°C	± 1% of fsd
5	Smoke density test apparatus	0-4.2 kg/cm ²	± 0.2kg/cm ²
6	Thermal EMF test apparatus	500°C	± 1°C
7	High voltage test unit - 10 Kv AC	0 - 100 KV AC	± 5 %
8	Multicell type ageing oven	200°C	± 2.5 %
9	Cold chamber	-15 to 40°C	± 2.5 %
10	Flammability test -Pressure apparatus (IEC 332 P3)	0 - 7 Kg/cm ²	-
11	Torsion tester	99999 turns	± 1 count
12	Microohm meter	1.9999 mΩ - 1.9999 KΩ	± 0.05 %
13	Dial Vernier	0-150 mm	± 0.02 mm
14	Thermometer	-10 to 50°C	± 1.0°C
15	Decade Resistance box	0-200 ohms	± 1 %
16	Decade Capacitance box	0 μF - 1000 PF	± 1 %
17	Stop watch	1 HR	± 0.5 %
18	Thermal stability test apparatus	500°C	± 0.4°C
19	High voltage test unit - 6 Kv AC	0 - 6 kv AC, 0 - 10 A	± 1 % F.S.
20	Digital multimeter	Vac:1kv,Vdc:700v, Iac,dc:2A, R:30MW, F:1MHz,T:-200-+850°C	+/-{Vdc:0.05%, Vac:1%, Idc:0.7%, Iac:1%,R:0.5%, F:1%,T:1°C}
21	Megohmmeter	100 GΩ	± 3 %
22	Micrometer	0-25 mm	± 0.01 mm
23	Vernier	0-150 mm	± 0.02 mm
24	Vernier	0-150 mm	± 0.02 mm
25	Standard resistor	100 GΩ	± 5 %
26	Standard Inductance Box	1000 mH	± 0.1 to 1 %
27	Standard Slip Gauges Box	1 to 50 mm	Grade 2
28	High voltage test unit - 3 Kv, 6 Kv / 120KvA	0 - 6 Kv AC	± 5 %
29	Scale 1000mm	1000 mm	± 0.05 mm
30	High voltage probe	DC & AC (40 kV)	± 5%
31	Conditioning chamber	0 to 400° C	± 3°C
32	Hot Air Oven	500°C	± 2.5 %
33	Hot set oven	500°C	± 2.5 %



LIST OF TESTING EQUIPMENT

Sr. No.	Name of Testing Equipments	Measuring range of Equipment	Accuracy
34	Digital Calipaer	0-150 mm	+/- 0.01mm
35	Electronic Balance	0.1 gm - 6.0 kg	0.1 gm
36	Electronic Balance	0.001 gm - 220.0 gm	0.001 gm
37	Hot Air Oven	0 - 200°C	± 2.5 %
38	H.V. Test Panel (IEC 60331) / FS Cable Testing	300 - 1000 V	± 5 %
39	Conductivity Meter	0 to 10 μ S/cm	1 % F.S.
40	Microohm meter	19.999m Ω - 19.999 K Ω	± 0.05 %
41	Electronic Balance	0.0001 gm - 220.0 gm	0.0001 gm
42	Digital Thermocouple Test Set & Calibrator	-	-
43	Kelvin Double Bridge	0.2 μ Ω - 1.1 Ω	-
44	Temp. Controller with Sensor (IEC 60332 P-1)	0 - 999 °C	± 3°C
45	Hot Air Oven	0 - 300°C	± 2.5 %
46	Tensile Testing Machine	0.1 KN & 5.0 KN	-
47	RE DC High Voltage Tester	0 - 3 kV at 50 mA	± 1.5 % (F.S.D.)
48	Profile Projector	0 - 100 mm.	-
49	Million megohm meter	1M Ω - 50T Ω	± 3 %
50	Digital LCR Meter	20Mohms, 20henry, 20microfarads	R,L, C: ± 0.01 to 1%
51	Vaccume Oven	0 - 400 °C	± 2.5 %
52	Digital Multimeter	Vac:1kv,Vdc:1kv,lac, dc:10A,R:20MW	± 0.25 to 1.50 %
53	Thermometer	-10 to 250°C	± 1.0°C
54	Digital Calipaer	0-150 mm	+/- 0.01mm
55	Digital Calipaer	0-150 mm	+/- 0.01mm
56	Digital Micrometer	0-25 mm	+/- 0.001mm
57	Two Roll Mill		
58	Outside Micrometer	0-25 mm	+/- 0.01mm
59	Microohm meter	19.999 m Ω - 19.999 K Ω	± 0.05 %
60	Oxygen / Temp. Index test Instrument	0 - 400°C	± 1°C
61	Digital Insulation Tester	0 - 20,000 M Ω	±(5 % ±5)
62	Million megohm meter	1M Ω - 1.3T Ω	± 3 %
63	LF Static noise rejection ratio meter	0 - 120 dB	± 4 dB
64	Digital Micrometer	0-25 mm	+/- 0.001mm
65	Digital Calipaer	0-150 mm	+/- 0.01mm
66	Electronic Balance	0.0001 gm - 220.0 gm	-



MAJOR CONSULTANTS

List of Consultants / Inspection Agencies,
who have Approved ACPL Products

- 01 ABB Lummus Global B. V.
- 02 Air Liquide Engineering India Pvt. Ltd.
- 03 Aker Powergas Pvt. Ltd. (aker Solutions)
- 04 BARC, Mumbai
- 05 Baxcounsel Inspection Bureau Pvt. Ltd.
- 06 Bechtel India Ltd.
- 07 Bureau Veritas Industrial Services
- 08 Certification Engineers India Ltd.
- 09 Chemtex Engineering of India Ltd.
- 10 Chiyoda Corporation, Japan
- 11 Det Norske Veritas
- 12 Engineers India Ltd.
- 13 Fact Engineering and Design Organisation
- 14 Fitchner Consulting Engineers India Pvt. Ltd.
- 15 Germanischer Lloyds Mumbai
- 16 GNVFC Ltd., Gujarat
- 17 IFFCO Ltd.
- 18 International Development & Engg. Associates Ltd.
- 19 Intertek India Pvt. Ltd.
- 20 Indian Register of Shipping, Mumbai
- 21 Jacobs Engineering India Pvt. Ltd.
- 22 Kinetics Technology of India Ltd.
- 23 KRIBHCO Surat
- 24 L & T Sargent & Lundy Ltd.
- 25 Linde Engineering India Pvt. Ltd.
- 26 Lloyds Register India Ltd.
- 27 Lurgi India Company Ltd.
- 28 Oil And Natural Gas Corporation Ltd.
- 29 Project & Development India Ltd.
- 30 Quest Global Engineering
- 31 Reliance Industries Ltd.
- 32 Saipem Triune Engineering Pvt. Ltd., New Delhi.
- 33 SAIPEM U.K. Ltd.
- 34 Shell Global Solutions International (SGSI Mumbai)
- 35 The Royal Institution of Naval Architects-Rina (Mumbai)
- 36 Tata Consulting Engineers
- 37 TECHNIP, Italy
- 38 Tecnimont ICB Ltd.
- 39 Toyo Engineering India Ltd.
- 40 Tractebel Engineering International
- 41 TUV SUD South Asia /TUV-NORD
- 42 TUV-NORD
- 43 Uhde India Ltd.

EXPORT AWARDS & ACCOLADES

EEPC Export Awards



Star Performer (WR)
Small Enterprise
2004-05



Star Performer
Large Enterprise
2008-09



Star Performer
Medium Enterprise
2007-08



Star Performer
all India 2006-07



Highest Growth
all India 2005-06 in
Small Enterprise Category



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Oil & Gas Sector

- Engineers India Ltd.
- Hindustan Petroleum Corporation Ltd.
- Bharat Petroleum Corporation Ltd.
- Chennai Petroleum Corporation Ltd.
- Gas Authority of India Ltd.
- Indian Oil Corporation Ltd.
- Kochi Refineries Ltd.
- Reliance Industries Ltd.
- Reliance Gas Transportation Ltd.
- Heurtey Petrochem India Pvt Ltd.
- Essar Projects Ltd.
- Linde Engineering India Pvt. Ltd.
- Mangalore Refinery & Petrochemicals Ltd.
- Bramhaputra Crackers & Polymers Ltd.
- Numaligarh Refinery Ltd.
- Oil & Natural Gas Commission



Power

- Nuclear Power Corporation of India Ltd.
- National Thermal Power Corporation
- Kalpataru Power Transmission Ltd.
- Bharat Heavy Electrical Ltd.
- ThyssenKrupp Industries India Pvt. Ltd.



OEMs

- Honeywell Automation Pvt. Ltd.
- Kirloskar Pneumatic Company Ltd.
- Larsen & Toubro Automation Ltd.
- Air Liquide Engg India Pvt. Ltd.
- New Fire Engineers



Steel & Cements

- Bhushan Steel & Power Ltd.
- Jindal Steel & Power Ltd.
- JSW Steel Ltd.
- ACC Ltd.
- Grasim Industries Ltd.



Water

Treatment Plants

- Va Tech Wabag Ltd.
- Driplex Water Engineering Ltd.
- Thermax Ltd.



Chemicals & Fertilisers

- Gujarat Narmada Valley Fertilizers Co. Ltd.
- Indian Farmers Fertiliser Co-operative Ltd.
- Gujarat State Fertilisers & Chemicals Ltd.
- Nagarjuna Fertilizers Ltd.
- Meghamani Fine Chemical Ltd.
- Rashtriya Chemicals and Fertilizers
- Coramandel International Ltd.
- Tamilnadu Petroproducts Ltd.
- KRIBHCO
- Deepak Fertilisers & Chemicals Corp. Ltd.
- BASF India Ltd.
- MCC PTA India Corp. Private Ltd.



Consultants & Contractors

- Toyo Engineering India Ltd.
- Punj Lloyd Ltd.
- Invensys India Pvt. Ltd.
- Technip KT India Ltd.
- Technimont ICB Pvt. Ltd.
- Hindustan Dorr-Oliver Ltd.
- Larsen & Toubro Ltd.
- Uhde India Ltd.
- Gammon India Ltd.



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