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# PVC INSULATED POWER AND CONTROL CABLES



An ISO- 9001- 2008 Accredited Company

IS 1554  
(PT 1):1988



## PVC INSULATED POWER AND CONTROL CABLES AS PER IS: 1554 (PART - 1) –1988

SBEE have manufacturing facility at Bangalore, India with state-of-the-art machine with latest technology and faster machine speeds from wire drawing to cable testing, from purchase to despatch. SBEE PVC insulated & sheathed cables offered with copper & aluminium conductors unarmoured and armoured with galvanized steel wire /strip. These cables are suitable for heavy - duty power control and instrumentation application in power generation utilities, industrial distribution, chemical & fertilizer industries & mining Installation. SBEE cables also design & manufacture cables for specialized application. These cables are marked as 1.1KV grade a per IS: 1554 (PART - 1) 1988

### CONDUCTOR :-

The conductors of power cables are made from electrical purity aluminium, and those of control cables are of annealed high conductivity copper. Power cables with copper conductor can also be supplied against order. All conductors conform to IS: 8130-1984

COPPER	ALUMINIUM	CONSTRUCTION	FLEXIBILITY
	1.5 Sq. mm	Solid	Class - 1
1.5 sq mm to 6 sq mm	2.5 sq mm to 10 sq mm	Solid/Stranded	Class -1 for Solid Class -2 for Stranded
10 sq mm & above	6 sq. mm & above	Stranded	Class - 2

### INSULATION

High quality PVC compound applied over conductor by extrusion. General Purpose PVC insulation with maximum operating temperature of 70 degC and heat resisting PVC with maximum operating temperature of 85 degC are used for 1.1kv cables. Heat Resistance PVC upto 105 degC can be available on request.

The Insulation and Outer sheathing compounds shall be conforming to IS: 5831 – 1984 as per the requirement of IS: 1554 (PART - 1) 1988.

### LAYING UP OF THE CORES

In twin, three and multicore cables, the cores are laid up together with a suitable lay; the outermost Layer is having right hand lay and the successive layers are laid with opposite lay; where necessary, the interstices shall be filled with non - hygroscopic material.

### CORE IDENTIFICATION

Colour Scheme: Cores are identified by colour scheme of PVC insulation. The following colour scheme is normally adopted:

- 1 Core - Red, Black, Yellow, Blue or natural (non pigmented)
- 2 Core - Red and Black
- 3 Core - Red, Yellow and Blue
- 4 Core - Red, Yellow, Blue & Black (Reduced Neutral core in three and half core is Black.)
- 5 Core - Red, Yellow, Blue, Black & Grey
- 6 Cores & Above - Two adjacent cores (counting and directional) in each layer are coloured blue and yellow respectively and remaining cores are Grey.

Alternatively core with number printing can be offered.

**INNER SHEATH :** For all cables having two or more core, extruded sheath of PVC Compound or wrapping of thermoplastic or proofed tapes applies a common covering (Inner Sheath) over the laid up cores.

**ARMOURING :** For multicore cables armouring is applied over the Inner sheath. In case of cable where fictitious diameter over inner sheath does not exceed 13mm, the armour consist of galvanized round steel wires. For single core armoured cables, non- magnetic armouring is provided over the insulation. The direction of lay of armour is left hand in case of double armoured wire. This requirement is applicable to inner layer of armouring, the outer layer of armour is applied with right hand lay and there is a separator of PVC tape between the layer of armour strip wires.

**OUTER SHEATH :** Outer sheath is extruded over the armouring. In case of multi-core unarmoured cables, it is extruded over the laid up cores.

For unarmoured single core cables, it is extruded over the insulation. This is always black in colour for best resistance to outdoor exposure. Any other colour can be Available on request.

**IDENTIFICATION :** Our brand name SBEE along with voltage is embossed on the outer sheath through out the length of the cable at regular intervals, Cables with heat resisting PVC insulation are identified by letters "HR" embossed on the outer sheath; Our brand SBEE, Voltage Grade, Cross Sectional Area, year of manufacturing & number of core are printed on the drums.

**CABLE CODE :** As per IS: 1554 (part -1) 1988, the product is coded by alphabets.

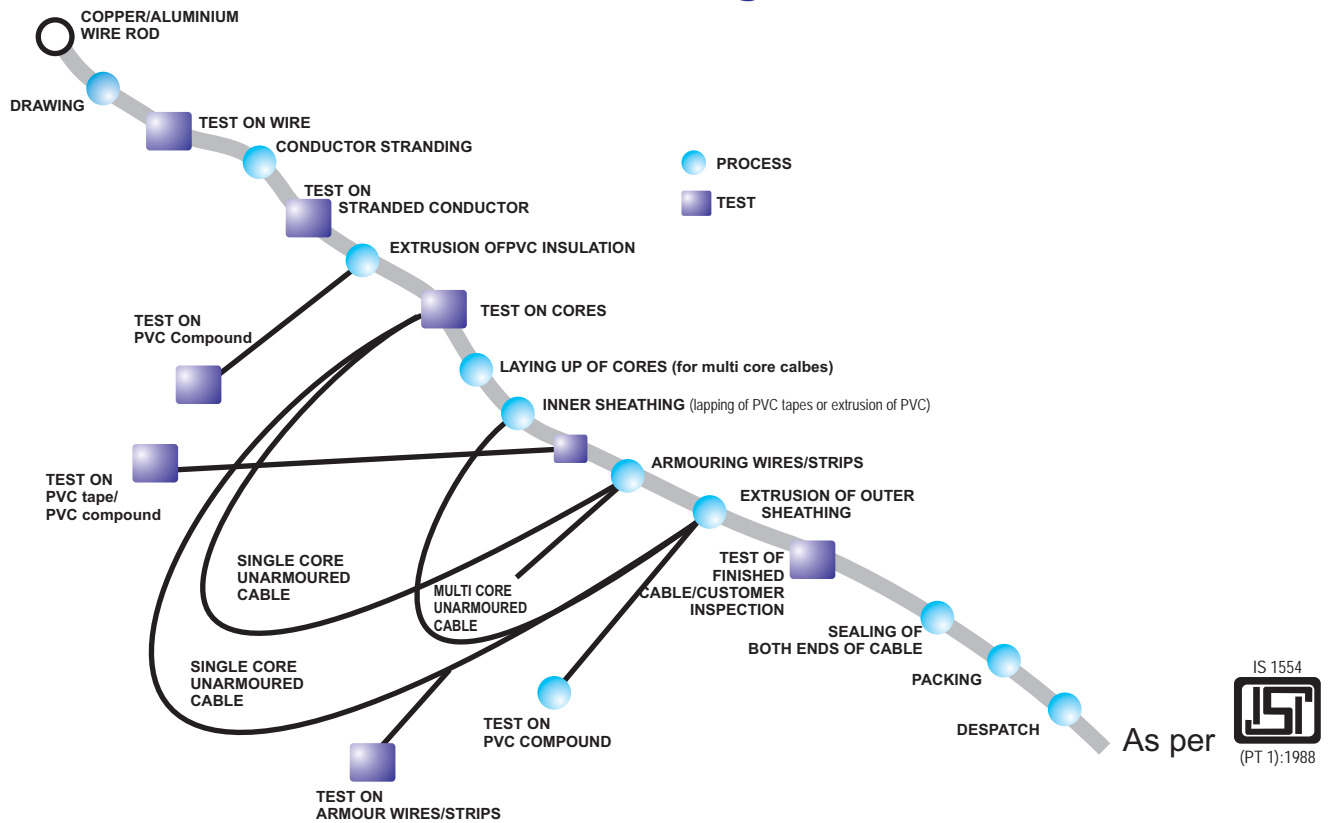
Aluminium	A
PVC Insulation	Y
Steel Round Wire Armour	W
Steel strip Armour	F
Steel Double Round Wire Armour	WW
Steel Double strip Armour	FF
PVC Outer Sheath	Y
Aluminium Wire Armour	AW

No code letter is required when conductor material is copper. This product code is stenciled on the surface of the drum flange.

**FRLS CABLES :** In the recent past, the growing awareness of hazards due to fire incidence in power plants, high rise buildings, cable galleries etc, had resulted in the development of FRLS cables. The characteristics of FRLS cable are the following:-

- 1 Flame Retardance
- 2 Low Smoke Emission
- 3 Low Acid Gas Emission

# Cable Manufacturing Process



- Single and Multicore building wires with FRLS, HRFR, ZHFR, ZOFR Insulation
- Single core and Multicore cables upto 3.3 KV, XLPE/PVC insulated aluminium power cables upto 4 cores and copper control cables upto 100 cores with armoured and un-armoured conf to is 7098:1988 & IS 1554: 1998 (part 1) standards.
- L.V. aerial branched cables upto 3.3 KV range
- Single and Multicore copper flexible cables for industrial use.
- Signal and Instrumentation cables with Aluminium and copper screening with ATC braiding, Armoured and Un-armoured upto 100 pairs/traids
- Submersible flat cables and winding wires.
- Special cables as per customer requirement/design.
- Cables & wires as per UL & CUL recognition of AWM Style No. 1007, 1015, 1569, 1032, 2464, 2129

- Airports
- Automobile
- Building & Construction Industries
- Cement Industries
- Chemical & Process Industries
- Fertilizer Industries
- Hydro Power Generation
- Information Technology Industries
- Mining
- Nuclear Power Generation
- Ordinance Factories & Defence Installations
- Petrochemical Industries / LPG Plants
- Petroleum Refineries & Port Terminals
- Power Electricity Distribution Industries
- Railways
- Steel Plants & Industries
- Thermal Power Generation
- Turnkey Electrical Contractors
- Wind Power Generation

**SBEE'S**  
OTHER RANGE OF PRODUCTS

**PRIME**  
MARKET SEGMENT

**TABLE 1**

**CONDUCTOR DATA**

**IS:1554 PART-1 - 1988 CONDUCTOR DATA, COPPER & ALUMINIUM CONDUCTOR FOR SINGLE CORE & MULTICORE CABLES CONFIRMING TO IS: 8130 (1984)**

NOMINAL CROSS SECTIONAL AREA	MINIMUM NUMBER OF WIRES IN THE STRANDED CONDUCTOR (CLASS - 2)				MAXIMUM DC RESISTANCE AT 20 deg C	
	CIRCULAR CONDUCTOR (NON COMPACTED)		CIRCULAR COMPACTED OR SHAPED CONDUCTOR		PLAIN COPPER CONDUCTOR	ALUMINIUM CONDUCTOR
Sqmm	COPPER	ALUMINIUM	COPPER	ALUMINIUM	Ohm/km	Ohm/km
1.5	3	3	—	—	12.1	18.1
2.5	3	3	—	—	7.41	12.1
4	7	3	—	—	4.61	7.41
6	7	3	—	—	3.08	4.61
10	7	7	6	—	1.83	3.08
16	7	7	6	6	1.15	1.91
25	7	7	6	6	0.727	1.2
35	7	7	6	6	0.524	0.868
50	19	19	6	6	0.387	0.641
70	19	19	12	12	0.268	0.443
95	19	19	15	15	0.193	0.32
120	37	37	18	15	0.153	0.253
150	37	37	18	15	0.124	0.206
185	37	37	30	30	0.0991	0.164
240	61	37	34	30	0.0754	0.125
300	61	61	34	30	0.0601	0.100
400	61	61	53	53	0.0470	0.0778
500	61	61	53	53	0.0366	0.0605
630	91	91	53	53	0.0283	0.0469
800	91	91	53	53	0.0221	0.0367
1000	91	91	53	53	0.0176	0.0291

**TABLE 2**

**CONDUCTOR RESISTANCE**

**IS :1554 PART1 - 1988 CALCULATED VALUE OF A.C.RESISTANCE OF CONDUCTOR (Ohm/km) AT MAXIMUM OPERATING CONDUCTOR TEMPERATURE**

Nominal Cross Sectional Area	PVC Cables (70 degC)		HR PVC Cables (85 degC)	
	ALUMINIUM	COPPER	ALUMINIUM	COPPER
Sqmm	ALUMINIUM	COPPER	ALUMINIUM	COPPER
1.5	21.72	14.52	22.81	15.25
2.5	14.52	8.892	15.25	9.34
4	8.892	5.532	9.34	5.81
6	5.530	3.696	5.81	3.88
10	3.696	2.196	3.88	2.31
16	2.292	1.380	2.41	1.45
25	1.440	0.873	1.51	0.916
35	1.042	0.629	1.09	0.661
50	0.769	0.465	0.808	0.488
70	0.532	0.322	0.559	0.338
95	0.384	0.232	0.404	0.244
120	0.304	0.184	0.318	0.193
150	0.248	0.150	0.259	0.156
185	0.197	0.119	0.209	0.129
240	0.152	0.0904	0.159	0.095
300	0.122	0.0721	0.126	0.076
400	0.0934	0.0664	0.098	0.059
500	0.0726	0.0439	0.076	0.046
630	0.0563	0.0339	0.059	0.0356

**TABLE 3**

**REACTANCE & CAPACITANCE**

**IS :1554 PART1 - 1988 APPROXIMATE REACTANCE AT 50HZ (OHM/KM) AND CAPACITANCE (MICRO FARADS/KM) 1.1KV PVC AND HR PVC CABLES**

Nominal Area of Conductor	REACTANCE			CAPACITANCE				
	PVC AND HR PVC CABLES SINGLE CORE		MULTICORE	Nominal Area Of Conductor	PVC AND HR PVC CABLES SINGLE CORE		TWO CORE	THREE, THREE & HALF AND FOUR CORE
	Unarmoured	Armoured			Unarmoured	Armoured		
<b>Sqmm</b>				<b>sq.mm</b>				
1.5	0.157	—	0.11	1.5	0.43	—	0.12	0.35
2.5	0.145	—	0.106	2.5	0.52	—	0.13	0.41
4	0.136	—	0.102	4	0.57	—	0.14	0.46
6	0.128	—	0.0962	6	0.67	—	0.16	0.52
10	0.118	0.137	0.0908	10	0.83	0.67	0.18	0.63
16	0.110	0.128	0.0859	16	0.97	0.80	0.19	0.82
25	0.107	0.122	0.0849	25	1.0	0.83	0.22	0.86
35	0.106	0.116	0.0823	35	1.15	0.95	0.24	0.98
50	0.0973	0.110	0.0765	50	1.26	0.95	0.24	1.00
70	0.0924	0.107	0.0769	70	1.32	1.12	0.26	1.16
95	0.090	0.103	0.0766	95	1.36	1.17	0.26	1.18
120	0.088	0.0989	0.0741	120	1.49	1.28	0.28	1.31
150	0.0862	0.0960	0.0743	150	1.52	1.32	0.28	1.28
185	0.0857	0.0950	0.0742	185	1.47	1.30	0.28	1.30
240	0.0837	0.0929	0.0737	240	1.54	1.37	0.28	1.34
300	0.0828	0.0922	0.0733	300	1.60	1.40	0.29	1.37
400	0.0810	0.0893	0.0729	400	1.70	1.50	0.29	1.43
500	0.0807	0.0890	0.0732	500	1.63	1.46	0.29	1.41
630	0.0803	0.0876	0.0731	630	1.64	1.45	0.29	1.42
800	0.0782	0.0862	—	800	1.87	1.65	—	—
1000	0.0772	0.0849	—	1000	2.05	1.76	—	—

**TABLE 4**

**DIMENSIONS AND WEIGHTS**

**'SBEE' 1.1KV SINGLECORE PVC INSULATED UNARMOURED AND ARMoured CABLE WITH ALUMINIUM CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Nominal Area of Conductor	Form of Conductor	UNARMOURED - AYY				Nominal Thickness of Insulation of Armoured Cable	AL ROUND WIRE ARMoured - AYWAY				AL FLAT ARMoured - AYFAY				Normal Delivery Length (mtrs)
		Nominal Thickness Of Insulation	Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable		Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	
<b>Sqmm</b>		(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	
4	So. Ci.	1.0	1.8	8.5	76	1.3	1.4	1.24	10.5	215					1000
4	St. Ci.	1.0	1.8	8.8	80	1.3	1.4	1.24	10.9	226					1000
6	So. Ci.	1.0	1.8	9.0	88	1.3	1.4	1.24	11.5	240					1000
6	St. Ci.	1.0	1.8	9.2	92	1.3	1.4	1.24	11.7	255					1000
10	So. Ci.	1.0	1.8	10.0	109	1.3	1.4	1.24	13	182					1000
10	St. Ci.	1.0	1.8	10.5	115	1.3	1.4	1.24	12.9	192					1000
16	Co. Ci.	1.0	1.8	11.0	145	1.3	1.4	1.24	13.8	359					1000
25	Co. Ci.	1.2	1.8	12.5	197	1.5	1.4	1.24	15.5	225					1000
35	Co. Ci.	1.2	1.8	13.5	240	1.5	1.4	1.24	16.5	333					1000
50	Co. Ci.	1.4	1.8	15.1	301	1.7	1.4	1.24	18.2	406					1000
70	Co. Ci.	1.4	1.8	16.5	392	1.7	1.4	1.4	20.2	512					1000
95	Co. Ci.	1.6	1.8	18.7	505	1.9	1.6	1.4	22.7	672	4.0x0.80	1.4	21.5	595	1000
120	Co. Ci.	1.6	2.0	21.2	620	1.9	1.6	1.4	24.0	766	4.0x0.80	1.4	23.0	676	1000
150	Co. Ci.	1.8	2.0	22.4	749	2.1	1.6	1.4	25.7	897	4.0x0.80	1.4	24.5	808	1000
185	Co. Ci.	2.0	2.0	24.5	896	2.3	1.6	1.4	28.2	1065	4.0x0.80	1.4	27.0	962	1000
240	Co. Ci.	2.2	2.0	27.4	1115	2.5	1.6	1.56	31.4	1321	4.0x0.80	1.4	30.0	1190	1000
300	Co. Ci.	2.4	2.0	30.1	1356	2.7	1.6	1.56	33.9	1570	4.0x0.80	1.56	32.7	1452	1000
400	Co. Ci.	2.6	2.2	34.0	1754	3.0	2.0	1.56	38.2	2020	4.0x0.80	1.56	36.7	1717	500
500	Co. Ci.	3.0	2.2	37.6	2158	3.4	2.0	1.72	42.4	2513	4.0x0.80	1.56	40.7	2230	500
630	Co. Ci.	3.4	2.4	42.4	2671	3.9	2.0	1.88	47.4	3160	4.0x0.80	1.72	45.7	2844	500
800	Co. Ci.	3.4	2.4	48.0	3278	3.9	2.0	1.88	52.5	3781	4.0x0.80	1.88	50.5	3466	500
1000	Co. Ci.	3.4	2.6	52.1	3964	3.9	2.5	2.04	57.5	4685	4.0x0.80	2.04	54.5	4193	500

So.Ci= Solid Circular, St.Ci=Stranded Circular, Co.Ci=Compacted Circular, St.Sh= Stranded Shaped

**TABLE 5**

**DIMENSIONS AND WEIGHTS**

**IS :1554 PART1 - 1988 DIMENSIONS AND WEIGHTS 1100VOLTS TWO CORE PVC INSULATED UNARMoured AND ARMoured WITH ALUMINIUM CONDUCTOR**

Nominal Area of Conductor	Form of Conductor	UNARMoured - AYY				Nominal Thickness of Insulation of Armoured Cable	ROUND WIRE ARMoured - AYWY				FLAT ARMoured - AYFY				Normal Delivery Length (mtrs)
		Nominal Thickness Of Insulation	Nominal Thickness of Outer Sheath	Nominal Thickness of Outer Sheath	Appx. Weight of Cable		Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	
Sqmm		(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	
4	So. Cr.	1.0	0.3	1.8	13.5	200	1.4	1.24	14.5	474					1000
4	St. Cr.	1.0	0.3	1.8	14.0	241	1.4	1.24	15.0	537					1000
6	So. Cr.	1.0	0.3	1.8	14.5	250	1.4	1.24	16.0	550					1000
6	St. Cr.	1.0	0.3	1.8	15.0	274	1.4	1.24	16.5	520					1000
10	So. Cr.	1.0	0.3	1.8	16.0	300	1.4	1.24	17.5	640					1000
10	St. Cr.	1.0	0.3	1.8	17.0	338	1.4	1.24	18.0	660					1000
16	St. Sh.	1.0	0.3	1.8	19.0	413	1.6	1.4	21.0	842	4.0x0.8	1.4	19.5	510	1000
25	St. Sh.	1.2	0.3	2.0	20.0	430	1.6	1.4	22.5	935	4.0x0.8	1.4	21.0	700	1000
35	St. Sh.	1.2	0.3	2.0	21.5	506	1.6	1.4	24.0	1091	4.0x0.8	1.4	22.0	769	1000
50	St. Sh.	1.4	0.3	2.0	24.0	650	1.6	1.56	26.7	1290	4.0x0.8	1.4	25.0	964	1000
70	St. Sh.	1.4	0.4	2.0	26.5	810	1.6	1.56	29.3	1473	4.0x0.8	1.56	27.5	1192	500
95	St. Sh.	1.6	0.4	2.2	31.0	1156	2.0	1.56	33.7	2113	4.0x0.8	1.56	31.5	1585	500
120	St. Sh.	1.6	0.4	2.2	32.5	1329	2.0	1.72	36.2	2364	4.0x0.8	1.56	33.0	1781	500
150	St. Sh.	1.8	0.5	2.4	36.5	1638	2.0	1.72	39.5	2766	4.0x0.8	1.72	37.0	2106	500
185	St. Sh.	2.0	0.5	2.4	40.0	2016	2.0	1.88	43.5	2326	4.0x0.8	1.88	41.0	2588	500
240	St. Sh.	2.2	0.6	2.6	44.0	2540	2.5	2.04	48.7	4360	4.0x0.8	2.04	45.5	3188	500
300	St. Sh.	2.4	0.7	2.8	50.0	3090	2.5	2.2	54.2	5060	4.0x0.8	2.2	50.5	3776	500
400	St. Sh.	2.6	0.7	3.2	56.0	3973	3.15	2.52	62.5	6921	4.0x0.8	2.36	57.0	4725	500
500	St. Sh.	3.0	0.7	3.4	65.0	4989	3.15	2.84	71.5	8291	4.0x0.8	2.68	66.0	5872	500
630	St. Sh.	3.4	0.7	3.8	73.5	6355	4.0	3.0	81.5	11093	4.0x0.8	2.84	73.0	7278	500

So.Ci= Solid Circular, St.Ci=Stranded Circular, Co.Ci=Compacted Circular, St.Sh= Stranded Shaped

**TABLE 6**

**'SBEE' 1.1KV THREE CORE PVC INSULATED UNARMoured AND ARMoured CABLE WITH ALUMINIUM CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Nominal Area of Conductor	Form of Conductor	UNARMoured - AYY					ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (mtrs)
		Nominal Thickness Of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	
Sqmm		(mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	
4	So. Cr.	1.0	0.3	1.8	14.0	220	1.4	1.24	17.5	525					1000
4	St. Cr.	1.0	0.3	1.8	15.5	268	1.4	1.24	17.7	576					1000
6	So. Cr.	1.0	0.3	1.8	15.5	275	1.4	1.24	18.5	590					1000
6	St. Cr.	1.0	0.3	1.8	16.5	300	1.4	1.24	18.8	642					1000
10	So. Cr.	1.0	0.3	1.8	17.0	340	1.4	1.4	20.5	714					1000
10	St. Cr.	1.0	0.3	1.8	18.0	353	1.4	1.4	21.0	767					1000
16	St. Sh.	1.0	0.3	1.8	18.0	384	1.6	1.4	21.2	838	4.0x0.8	1.4	19.5	643	1000
25	St. Sh.	1.2	0.3	2.0	21.0	554	1.6	1.4	24.0	1060	4.0x0.8	1.4	22.3	837	500
35	St. Sh.	1.2	0.3	2.0	23.0	681	1.6	1.4	26.2	1226	4.0x0.8	1.4	24.0	976	500
50	St. Sh.	1.4	0.3	2.0	26.0	850	1.6	1.56	29.6	1511	4.0x0.8	1.56	27.9	1230	500
70	St. Sh.	1.4	0.4	2.2	29.0	1122	2.0	1.56	33.3	2056	4.0x0.8	1.56	30.9	1520	500
95	St. Sh.	1.6	0.4	2.2	34.0	1473	2.0	1.72	37.7	2510	4.0x0.8	1.56	34.8	1947	500
120	St. Sh.	1.6	0.4	2.2	37.0	1720	2.0	1.72	40.5	2007	4.0x0.8	1.72	37.8	2248	500
150	St. Sh.	1.8	0.5	2.4	41.0	2258	2.0	1.88	44.0	3439	4.0x0.8	1.88	41.9	2700	500
185	St. Sh.	2.0	0.5	2.6	45.0	2660	2.5	2.04	49.5	4441	4.0x0.8	1.88	45.7	3234	500
240	St. Sh.	2.2	0.6	2.8	50.9	3401	2.5	2.2	55.0	5403	4.0x0.8	2.20	52.0	4063	500
300	St. Sh.	2.4	0.6	3.0	56.0	4150	2.5	2.36	60.5	6348	4.0x0.8	2.36	56.8	4883	500
400	St. Sh.	2.6	0.7	3.4	63.4	5319	3.15	2.68	69.0	8485	4.0x0.8	2.52	64.0	6071	500
500	St. Sh.	3.0	0.7	3.6	72.5	6653	3.15	3.0	79.5	10388	4.0x0.8	2.84	73.0	7641	250
630	St. Sh.	3.4	0.7	4.0	82.0	8537	4.0	3.0	89.5	13806	4.0x0.8	3.00	83.0	9580	250

So.Ci= Solid Circular, St.Ci=Stranded Circular, Co.Ci=Compacted Circular, St.Sh= Stranded Shaped

**TABLE 7**

**DIMENSIONS AND WEIGHTS**

**'SBEE' 1.1KV THREE AND A HALF CORE PVC INSULATED UNARMoured AND ARMoured CABLE WITH ALUMINIUM CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Nominal Area of Conductor	Nominal Thickness of Insulation		Minimum Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (mtrs)
	Power Core	Neutral Core		Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	
Sqmm	mm	mm	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	
25/16	1.2	1.0	0.3	2.0	23.8	657	1.6	1.4	26.0	1200	4.0x0.8	1.4	24.2	950	500
35/16	1.2	1.0	0.3	2.0	25.3	787	1.6	1.4	27.8	1364	4.0x0.8	1.4	26.1	1091	500
50/25	1.4	1.2	0.3	2.0	28.5	1052	1.6	1.56	32.0	1711	4.0x0.8	1.56	29.4	1471	500
70/35	1.4	1.2	0.4	2.2	32.9	1325	2.0	1.56	36.1	2335	4.0x0.8	1.56	33.5	1755	500
95/50	1.6	1.4	0.4	2.2	36.5	1720	2.0	1.72	40.5	2881	4.0x0.8	1.56	37.0	2192	500
120/70	1.6	1.4	0.5	2.4	39.8	2110	2.0	1.88	43.5	3364	4.0x0.8	1.72	40.3	2619	500
150/70	1.8	1.4	0.5	2.4	44.0	2470	2.0	1.88	47.8	3890	4.0x0.8	1.88	45.5	3100	500
185/95	2.0	1.6	0.5	2.6	48.0	3026	2.5	2.04	52.8	4997	4.0x0.8	2.04	49.0	3745	500
240/120	2.2	1.6	0.6	3.0	55.0	3975	2.5	2.36	59.6	6159	4.0x0.8	2.2	55.4	4649	500
300/150	2.4	1.8	0.6	3.2	61.0	4805	3.15	2.52	66.5	8003	4.0x0.8	2.36	61.0	5625	500
400/185	2.6	2.0	0.7	3.4	68.0	6110	3.15	2.68	74.0	9562	4.0x0.8	2.68	68.9	6950	500
500/240	3.0	2.2	0.7	3.8	79.0	7748	4.0	3.0	87.0	12990	4.0x0.8	2.84	80.0	8785	250
630/300	3.4	2.4	0.7	4.0	89.0	9797	4.0	3.0	95.5	15665	4.0x0.8	3.0	90.5	10948	250

So.Ci= Solid Circular, St.Ci=Stranded Circular, Co.Ci=Compacted Circular, St.Sh= Stranded Shaped

**TABLE 8**

**DIMENSIONS AND WEIGHTS**

**'SBEE' 1.1KV FOUR CORE PVC INSULATED UNARMoured AND ARMoured CABLE WITH ALUMINIUM CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Nominal Area of Conductor	Form of Conductor	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Appx. Weight of Cable	Normal Delivery Length (mtrs)
				Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable			
sq.mm		(mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(kg/km)		
4	So.Ci.	1.0	0.3	1.8	16.5	260	1.4	1.24	18.5	590					1000	
4	St.Ci.	1.0	0.3	1.8	16.8	300	1.4	1.24	18.9	655					1000	
6	So.Ci.	1.0	0.3	1.8	17.5	320	1.4	1.24	20.0	680					1000	
6	St.Ci.	1.0	0.3	1.8	17.7	367	1.4	1.24	20.3	735					1000	
10	So.Ci.	1.0	0.3	1.8	19.5	400	1.4	1.4	22.5	880	4.0x0.8	1.4	21.0	680	1000	
10	St.Ci.	1.0	0.3	1.8	19.8	456	1.4	1.4	22.8	910	4.0x0.8	1.4	21.2	738	1000	
16	St.Sh.	1.0	0.3	2.0	21.1	511	1.6	1.4	23.9	1002	4.0x0.8	1.4	22.4	770	1000	
25	St.Sh.	1.2	0.3	2.0	24.2	695	1.6	1.4	26.4	1245	4.0x0.8	1.4	24.9	1024	500	
35	St.Sh.	1.2	0.3	2.0	26.4	831	1.6	1.56	28.9	1493	4.0x0.8	1.4	27.0	1190	500	
50	St.Sh.	1.4	0.4	2.2	30.7	1150	1.6	1.56	33.7	2079	4.0x0.8	1.56	31.2	1550	500	
70	St.Sh.	1.4	0.4	2.2	34.0	1437	2.0	1.56	37.0	2435	4.0x0.8	1.56	34.5	1911	500	
95	St.Sh.	1.6	0.4	2.4	39.0	1945	2.0	1.72	42.0	3139	4.0x0.8	1.72	39.5	2420	500	
120	St.Sh.	1.6	0.5	2.4	42.0	2310	2.0	1.88	45.5	3645	4.0x0.8	1.88	43.0	2881	500	
150	St.Sh.	1.8	0.5	2.6	46.5	2820	2.5	2.04	50.4	4725	4.0x0.8	1.88	47.0	3421	500	
185	St.Sh.	2.0	0.6	2.8	52.5	3520	2.5	2.2	56.5	5603	4.0x0.8	2.04	52.3	4166	500	
240	St.Sh.	2.2	0.6	3.0	58.0	4535	2.5	2.36	62.2	6758	4.0x0.8	2.36	58.9	5224	500	
300	St.Sh.	2.4	0.7	3.4	65.0	5695	3.15	2.68	70.0	8874	4.0x0.8	2.52	65.0	6430	500	
400	St.Sh.	2.8	0.7	3.6	72.0	6875	3.15	2.84	77.4	10576	4.0x0.8	2.84	72.5	7800	500	
500	St.Sh.	3.0	0.7	4.0	84.0	8243	4.0	3.0	90.0	14152	4.0x0.8	3.0	84.0	9849	250	
630	St.Sh.	3.4	0.7	4.0	84.5	11087	4.0	3.0	101.0	17258	4.0x0.8	3.0	94.5	12308	250	

So.Ci= Solid Circular, St.Ci=Stranded Circular, Co.Ci=Compacted Circular, St.Sh= Stranded Shaped

PVC INSULATED POWER & CONTROL CABLES

**TABLE 9**

**DIMENSIONS AND WEIGHTS**

**'SBEE' 1.1KV 1.5Sq.mm (SOLID) PVC INSULATED UNARMoured AND ARMoured  
MULTICORE CONTROL CABLE WITH COPPER CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Number of Cores	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (Mtrs)	
			Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable		
	mm	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/km)	
2	0.8	0.3	1.8	11.5	150	1.4	1.24	14.0	357						1000
3	0.8	0.3	1.8	12.0	170	1.4	1.24	14.5	390						1000
4	0.8	0.3	1.8	13.0	200	1.4	1.24	15.5	446						1000
5	0.8	0.3	1.8	14.0	239	1.4	1.24	16.0	490						1000
6	0.8	0.3	1.8	15.0	261	1.4	1.24	17.0	530						1000
7	0.8	0.3	1.8	15.0	271	1.4	1.24	17.0	540						1000
8	0.8	0.3	1.8	16.0	312	1.4	1.24	18.0	608						1000
9	0.8	0.3	1.8	17.0	353	1.4	1.24	19.0	670						1000
10	0.8	0.3	1.8	18.0	388	1.4	1.4	20.5	726						1000
12	0.8	0.3	1.8	18.5	416	1.6	1.4	21.5	850	4.0x0.80	1.24	19.5	631		1000
14	0.8	0.3	1.8	19.0	466	1.6	1.4	22.5	919	4.0x0.80	1.4	21.0	709		1000
16	0.8	0.3	1.8	20.0	521	1.6	1.4	23.5	1006	4.0x0.80	1.4	21.5	776		1000
19	0.8	0.3	2.0	21.5	600	1.6	1.4	24.0	1091	4.0x0.80	1.4	22.5	866		1000
21	0.8	0.3	2.0	22.5	670	1.6	1.4	25.5	1184	4.0x0.80	1.4	23.5	937		500
24	0.8	0.3	2.0	24.5	750	1.6	1.4	27.5	1309	4.0x0.80	1.4	25.5	1058		500
27	0.8	0.3	2.0	25.0	810	1.6	1.4	28.0	1393	4.0x0.80	1.4	26.0	1135		500
30	0.8	0.3	2.0	26.0	890	1.6	1.4	28.5	1498	4.0x0.80	1.4	27.0	1221		500
33	0.8	0.3	2.0	27.0	907	1.6	1.4	29.5	1589	4.0x0.80	1.4	28.0	1310		500
37	0.8	0.3	2.0	28.0	1050	1.6	1.4	30.5	1711	4.0x0.80	1.4	29.0	1421		500
44	0.8	0.3	2.0	31.0	1280	1.6	1.56	34.0	1998	4.0x0.80	1.56	32.5	1677		500
52	0.8	0.4	2.2	33.0	1464	2.0	1.56	36.5	2446	4.0x0.80	1.56	34.0	1903		500
61	0.8	0.4	2.2	34.5	1678	2.0	1.56	38.0	2734	4.0x0.80	1.56	36.0	2148		500

**TABLE 10**

**'SBEE' 1.1KV 1.5Sq.mm (STRANDED) PVC INSULATED UNARMoured AND ARMoured  
MULTICORE CONTROL CABLE WITH COPPER CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Number of Cores	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (Mtrs)	
			Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable		
	mm	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/km)	
2	0.8	0.3	1.8	12.0	164	1.4	1.24	14.5	378						1000
3	0.8	0.3	1.8	12.5	189	1.4	1.24	15.0	415						1000
4	0.8	0.3	1.8	13.5	222	1.4	1.24	16.0	471						1000
5	0.8	0.3	1.8	14.5	262	1.4	1.24	16.5	535						1000
6	0.8	0.3	1.8	15.5	279	1.4	1.24	18.0	576						1000
7	0.8	0.3	1.8	15.5	290	1.4	1.24	18.0	587						1000
8	0.8	0.3	1.8	16.5	334	1.4	1.24	19.0	654						1000
9	0.8	0.3	1.8	17.5	379	1.4	1.24	20.0	722						1000
10	0.8	0.3	1.8	19.0	393	1.4	1.4	21.5	777						1000
12	0.8	0.3	1.8	19.5	443	1.6	1.4	22.5	896	4.0x0.80	1.24	20.5	667		1000
14	0.8	0.3	1.8	20.0	498	1.6	1.4	23.5	983	4.0x0.80	1.4	21.5	748		1000
16	0.8	0.3	1.8	21.0	558	1.6	1.4	24.0	1059	4.0x0.80	1.4	22.5	819		1000
19	0.8	0.3	2.0	22.5	650	1.6	1.4	25.5	1164	4.0x0.80	1.4	23.5	912		1000
21	0.8	0.3	2.0	23.5	717	1.6	1.4	26.5	1262	4.0x0.80	1.4	25.0	987		500
24	0.8	0.3	2.0	26.0	801	1.6	1.4	28.5	1409	4.0x0.80	1.4	27.0	1115		500
27	0.8	0.3	2.0	26.5	875	1.6	1.4	29.0	1498	4.0x0.80	1.4	27.5	1195		500
30	0.8	0.3	2.0	27.5	952	1.6	1.4	30.0	1591	4.0x0.80	1.4	28.5	1285		500
33	0.8	0.3	2.0	28.0	1037	1.6	1.4	31.0	1706	4.0x0.80	1.4	29.5	1378		500
37	0.8	0.3	2.0	29.0	1133	1.6	1.4	32.0	1818	4.0x0.80	1.4	30.5	1494		500
44	0.8	0.3	2.0	32.5	1329	1.6	1.56	35.5	2134	4.0x0.80	1.56	34.0	1764		500
52	0.8	0.4	2.2	34.5	1570	2.0	1.56	38.0	2626	4.0x0.80	1.56	35.5	2046		500
61	0.8	0.4	2.2	36.0	1799	2.0	1.56	40.0	2963	4.0x0.80	1.56	37.5	2257		500

PVC INSULATED POWER & CONTROL CABLES



**TABLE 11**

**DIMENSIONS AND WEIGHTS**

**'SBEE' 1.1KV 2.5Sq.mm (SOLID) PVC INSULATED UNARMoured AND ARMoured  
MULTICORE CONTROL CABLE WITH COPPER CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Number of Cores	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (Mtrs)	
			Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable		
	mm	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/km)	
2	0.9	0.3	1.8	13.0	200	1.4	1.24	15.0	438						1000
3	0.9	0.3	1.8	13.5	234	1.4	1.24	15.5	483						1000
4	0.9	0.3	1.8	14.5	281	1.4	1.24	16.5	550						1000
5	0.9	0.3	1.8	15.5	331	1.4	1.24	18.0	620						1000
6	0.9	0.3	1.8	16.5	356	1.4	1.24	19.0	676						1000
7	0.9	0.3	1.8	16.5	374	1.4	1.24	19.0	694						1000
8	0.9	0.3	1.8	18.0	434	1.4	1.4	20.5	795						1000
9	0.9	0.3	1.8	19.0	492	1.6	1.4	22.5	946	4.0x0.80	1.4	20.5	726		1000
10	0.9	0.3	1.8	20.5	510	1.6	1.4	23.5	998	4.0x0.80	1.4	22.0	779		1000
12	0.9	0.3	2.0	21.5	600	1.6	1.4	24.0	1050	4.0x0.80	1.4	21.0	863		1000
14	0.9	0.3	2.0	22.5	680	1.6	1.4	25.0	1153	4.0x0.80	1.4	22.0	955		1000
16	0.9	0.3	2.0	23.5	760	1.6	1.4	26.0	1310	4.0x0.80	1.4	23.0	1052		1000
19	0.9	0.3	2.0	24.5	860	1.6	1.4	27.5	1404	4.0x0.80	1.4	25.0	1183		1000
21	0.9	0.3	2.0	26.0	950	1.6	1.4	28.5	1569	4.0x0.80	1.4	27.0	1284		500
24	0.9	0.3	2.0	28.5	1060	1.6	1.56	31.5	1736	4.0x0.80	1.4	29.5	1452		500
27	0.9	0.3	2.0	29.0	1160	1.6	1.56	32.0	1858	4.0x0.80	1.4	30.0	1568		500
30	0.9	0.3	2.0	30.0	1260	1.6	1.56	33.0	1996	4.0x0.80	1.56	31.5	1716		500
33	0.9	0.3	2.0	31.0	1400	1.6	1.56	34.0	2165	4.0x0.80	1.56	32.5	1847		500
37	0.9	0.4	2.2	32.5	1588	2.0	1.56	36.0	2550	4.0x0.80	1.56	34.0	2032		500
44	0.9	0.4	2.2	36.0	1866	2.0	1.56	40.0	2960	4.0x0.80	1.56	37.5	2374		500
52	0.9	0.4	2.2	38.0	2150	2.0	1.72	42.0	3328	4.0x0.80	1.56	39.0	2685		500
61	0.9	0.4	2.2	40.0	2472	2.0	1.72	44.0	3738	4.0x0.80	1.56	41.5	3050		500

**TABLE 12**

**'SBEE' 1.1KV 2.5Sq.mm (STRANDED) PVC INSULATED UNARMoured AND ARMoured  
MULTICORE CONTROL CABLE WITH COPPER CONDUCTOR CONFORMING TO IS : 1554 PART 1 -1988**

Number of Cores	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	UNARMoured - AYY			ROUND WIRE ARMoured - AYWY				FLAT STRIP ARMoured - AYFY				Normal Delivery Length (Mtrs)	
			Nominal Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Diameter of Round Wire	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable	Nominal Dimension of Flat Strip	Minimum Thickness of Outer Sheath	Appx. Overall Diameter of cable	Appx. Weight of Cable		
	mm	(mm)	(mm)	(mm)	(kg/km)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/km)	
2	0.9	0.3	1.8	13.5	210	1.4	1.24	15.5	447						1000
3	0.9	0.3	1.8	14.0	246	1.4	1.24	16.0	507						1000
4	0.9	0.3	1.8	15.0	294	1.4	1.24	17.5	579						1000
5	0.9	0.3	1.8	16.0	347	1.4	1.24	18.5	655						1000
6	0.9	0.3	1.8	17.5	373	1.4	1.24	19.5	704						1000
7	0.9	0.3	1.8	17.5	390	1.4	1.24	19.5	721						1000
8	0.9	0.3	1.8	18.5	451	1.4	1.4	21.5	835						1000
9	0.9	0.3	1.8	20.0	514	1.6	1.4	23.0	960	4.0x0.80	1.4	21.5	764		1000
10	0.9	0.3	1.8	21.5	533	1.6	1.4	24.5	1030	4.0x0.80	1.4	23.0	821		1000
12	0.9	0.3	2.0	22.5	628	1.6	1.4	25.0	1125	4.0x0.80	1.4	23.5	908		1000
14	0.9	0.3	2.0	23.5	708	1.6	1.4	26.0	1214	4.0x0.80	1.4	24.5	1005		1000
16	0.9	0.3	2.0	24.5	790	1.6	1.4	27.5	1328	4.0x0.80	1.4	25.5	1106		1000
19	0.9	0.3	2.0	26.0	895	1.6	1.4	28.5	1479	4.0x0.80	1.4	27.0	1244		1000
21	0.9	0.3	2.0	27.0	1001	1.6	1.4	30.0	1620	4.0x0.80	1.4	28.0	1349		500
24	0.9	0.3	2.0	29.5	1111	1.6	1.56	33.0	1828	4.0x0.80	1.4	31.0	1527		500
27	0.9	0.3	2.0	30.5	1222	1.6	1.56	33.5	1956	4.0x0.80	1.4	31.5	1649		500
30	0.9	0.3	2.0	31.5	1338	1.6	1.56	34.5	2101	4.0x0.80	1.56	33.0	1803		500
33	0.9	0.3	2.0	32.0	1454	1.6	1.56	35.5	2251	4.0x0.80	1.56	34.0	1941		500
37	0.9	0.3	2.2	34.5	1653	2.0	1.56	38.0	2684	4.0x0.80	1.56	35.5	2135		500
44	0.9	0.4	2.2	38.5	1944	2.0	1.56	42.0	3111	4.0x0.80	1.56	39.5	2450		500
52	0.9	0.4	2.2	40.0	2243	2.0	1.72	44.0	3502	4.0x0.80	1.56	41.0	2740		500
61	0.9	0.4	2.2	42.5	2585	2.0	1.72	46.5	3929	4.0x0.80	1.56	43.5	3140		500

PVC INSULATED POWER & CONTROL CABLES

**TABLE 13**

**CURRENT RATING**

**14 TABLE**

IS : 1554 PART - 1 -1988

CONTINUOUS CURRENT RATING FOR **TWO SINGLE CORE,**  
650/1100 V UNARMoured OR NON - MAGNETIC PVC CABLES

IS : 1554 PART - 1 -1988

CONTINUOUS RATINGS FOR **THREE SINGLE CORE,**  
650/1100 V, UNARMoured OR NON - MAGNETIC ARMoured PVC CABLES

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	25	21	23	19	24	18
2.5	35	28	31	25	32	25
4	46	36	42	33	43	32
6	57	44	54	42	54	41
10	75	59	72	56	72	56
16	94	75	92	71	92	72
25	125	97	120	93	125	99
35	150	120	140	110	155	120
50	180	145	165	130	190	150
70	220	170	200	155	235	185
95	265	205	230	180	275	215
120	300	230	255	200	310	240
150	340	265	280	220	345	270
185	380	300	305	240	390	305
240	420	335	340	270	445	350
300	465	370	370	295	500	395
400	500	410	405	335	570	455
500	540	435	430	355	610	490
630	590	485	465	395	680	560
800	645	530	505	430	780	640
1000	705	580	555	470	900	740

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	22	17	21	17	20	15
2.5	30	24	29	24	27	21
4	39	31	38	30	35	27
6	49	39	48	37	44	35
10	65	51	64	51	60	47
16	85	66	83	65	82	64
25	110	86	110	84	110	84
35	130	100	125	100	130	105
50	155	120	150	115	165	130
70	190	140	175	135	205	155
95	220	175	200	155	245	190
120	250	195	220	170	280	220
150	280	220	245	190	320	250
185	305	240	260	210	370	290
240	345	270	285	225	425	335
300	375	295	310	245	475	380
400	400	325	335	275	550	435
500	425	345	355	295	590	480
630	470	390	375	320	660	550
800	530	440	410	350	770	640
1000	590	490	450	385	865	720

**TABLE 15**

IS : 1554 PART - 1 -1988 CURRENT RATINGS  
FOR **TWIN CORE,** 650/1100V ARMoured OR  
UNARMoured PVC CABLES

**16 TABLE**

IS : 1554 PART - 1 -1988 CURRENT RATINGS FOR **THREE,**  
**THREE AND A HALF AND FOUR CORE,** 650/1100V  
ARMoured OR UNARMoured PVC CABLES

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	23	18	20	16	20	16
2.5	32	25	27	21	27	21
4	41	32	35	27	35	27
6	50	40	44	34	45	35
10	70	55	58	45	60	47
16	90	70	75	58	78	59
25	115	90	97	76	105	78
35	140	110	120	92	125	99
50	165	135	145	115	155	125
70	205	160	180	140	195	150
95	240	190	215	170	230	185
120	275	210	235	190	265	210
150	310	240	270	210	305	240
185	350	275	300	240	350	275
240	405	320	345	275	410	325
300	450	355	385	305	465	365
400	490	385	425	345	530	420
500	520	415	460	365	575	455
630	565	460	510	405	655	520

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	21	16	17	14	17	13
2.5	27	21	24	18	24	18
4	36	28	30	23	30	23
6	45	35	38	30	39	30
10	60	46	50	39	52	40
16	77	60	64	50	66	51
25	99	76	81	63	90	70
35	120	92	99	77	110	86
50	145	110	125	95	135	105
70	175	135	150	115	165	130
95	210	165	175	140	200	155
120	240	185	195	155	230	180
150	270	210	225	175	265	205
185	300	235	255	200	305	240
240	345	275	295	235	355	280
300	385	305	335	260	400	315
400	425	335	360	290	455	375
500	470	370	405	320	540	425
630	515	405	445	350	610	480

PVC INSULATED POWER & CONTROL CABLES

**TABLE 17**

**CURRENT RATING**

IS : 1554 PART - 1 -1988 CURRENT RATINGS  
FOR **TWO SINGLE CORE**, 650/1100 V UNARMoured OR  
NON - MAGNETIC ARMoured HRPVC CABLES

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	29	24	26	22	29	22
2.5	40	32	35	29	38	30
4	52	41	48	38	52	38
6	65	50	62	48	65	49
10	86	67	82	64	86	67
16	107	86	105	81	110	86
25	143	111	137	106	150	119
35	171	137	160	125	186	144
50	205	165	188	148	228	180
70	251	194	228	177	282	222
95	302	234	262	205	330	258
120	342	262	291	228	372	288
150	388	302	319	251	414	324
185	433	342	348	274	468	366
240	479	382	388	308	534	420
300	530	422	422	336	600	474
400	570	467	462	382	684	546
500	616	496	490	405	732	588
630	673	553	530	450	816	672
800	735	604	576	490	936	768
1000	804	661	633	536	1080	888

**18 TABLE**

IS : 1554 PART - 1 -1988 CURRENT RATINGS  
FOR **THREE SINGLE CORE**, 650/1100 VOLTS UNARMoured OR  
NON - MAGNETIC ARMoured HR PVC CABLE

Nominal Area of Conductor	Laid Direct in the Ground - HR PVC		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	25	19	24	19	24	18
2.5	34	27	33	27	32	25
4	44	35	43	34	42	32
6	56	44	55	42	53	42
10	74	58	73	58	72	56
16	97	75	95	74	98	77
25	125	98	125	96	132	101
35	148	114	143	114	156	126
50	177	137	171	131	198	156
70	217	160	200	154	246	186
95	251	200	228	177	294	228
120	285	222	251	194	336	264
150	319	251	279	217	384	300
185	348	274	296	239	444	348
240	393	308	325	257	510	402
300	428	336	353	279	570	456
400	456	371	382	314	660	522
500	485	393	405	336	708	576
630	536	445	428	365	792	660
800	604	502	467	399	924	768
1000	673	559	513	439	1038	864

**TABLE 19**

IS : 1554 PART - 1 -1988 CURRENT RATINGS FOR  
**TWIN CORE**, 650/1100 VOLTS ARMoured OR  
UNARMoured HR PVC CABLES

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	26	21	23	18	24	19
2.5	36	29	31	24	32	25
4	47	36	40	31	42	32
6	57	46	50	39	54	42
10	80	63	66	51	72	56
16	103	80	86	66	94	71
25	131	103	111	87	126	94
35	160	125	137	105	150	119
50	188	154	165	131	186	150
70	234	182	205	160	234	180
95	274	217	245	194	276	222
120	314	239	268	217	318	252
150	353	274	308	239	366	288
185	399	314	342	274	420	330
240	462	365	393	314	492	390
300	513	405	439	348	558	438
400	559	439	485	393	636	504
500	593	473	524	416	690	546
630	644	524	581	462	786	624

**20 TABLE**

IS : 1554 PART - 1 CURRENT RATINGS FOR  
**THREE, THREE AND A HALF AND FOUR CORE**, 650/1100V  
ARMoured OR UNARMoured HR PVC CABLES

Nominal Area of Conductor	Laid Direct in the Ground		In Ducts		In the Air	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
Sqmm	Amps	Amps	Amps	Amps	Amps	Amps
1.5	24	18	19	16	20	16
2.5	31	24	27	21	29	22
4	41	32	34	26	36	28
6	51	40	43	34	47	36
10	68	52	57	44	62	48
16	88	68	73	57	79	61
25	113	87	92	72	108	84
35	137	105	113	88	132	103
50	165	125	143	108	162	126
70	200	154	171	131	198	156
95	239	188	200	160	240	186
120	274	211	222	177	276	216
150	308	239	257	200	318	246
185	342	268	291	228	366	288
240	393	314	336	268	426	336
300	439	348	382	296	480	378
400	485	382	410	331	546	450
500	536	422	462	365	648	510
630	587	462	507	399	752	576

**CURRENT RATINGS**

**PVC & HRPVC INSULATED COPPER CONDUCTOR 1.1 KV GRADE CONTROL CABLE**

Number of Cores	CROSS SECTION 1.5 <sup>2</sup> MM				CROSS SECTION 2.5 <sup>2</sup> MM			
	With PVC Insulation		With HRPVC Insulation		With PVC Insulation		With HRPVC Insulation	
	In ground	In Air	In ground	In Air	In ground	In Air	In ground	In Air
	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps
2	23	20	26	24	32	27	36	32
3	21	17	24	20	27	24	31	29
4	21	17	24	20	27	24	31	29
5	16	14	18	17	23	19	26	23
6	15	13	17	16	21	18	24	22
7	14	13	16	16	20	17	23	20
8	14	12	16	14	19	16	22	19
9	13	12	15	14	18	15	21	18
10	13	11	15	13	18	15	21	18
12	12	10	14	12	17	14	19	17
14	11	10	13	12	16	14	18	17
16	11	9	13	11	15	13	17	16
19	10	9	11	11	14	12	16	14
21	10	8	11	10	13	11	15	13
24	9	8	10	10	13	11	15	13
27	9	8	10	10	12	10	14	12
30	9	7	10	8	12	10	14	12
33	8	7	9	8	11	9	13	11
37	8	7	9	8	11	9	13	11
44	7	6	8	7	10	9	11	11
52	7	6	8	7	10	8	11	10
61	6	6	7	7	9	8	10	10

**BASIC ASSUMPTIONS:**

Continuous current ratings given are based on the following Assumptions:

- 1) Max. Conductor Temperature for continuous operation
  - PVC : 70°C
  - HR PVC : 85°C
- II) Thermal Resistivity Of Soi : 150°C cm/watt
- III) Thermal Resistivity Of PVC : 650°C cm/watt
- iv) Depth of Laying ( to the highest point of the cable laid direct in the ground or to the top surface of the duct : 75 Cm
- v) Method of Installation :
  - A) Single Core Cables : a) Two Cables in horizontal Touching.  
: b) Three cables in trefoil touching formation - Installed Singly
  - B) Multi core cables
- vi) In case of control cables all cores are assumed to be carrying full load current.

**SHORT CIRCUIT RATINGS:  
SHORT CIRCUIT RATING OF CONDUCTORS FOR  
ONE SECOND DURATION (KILO AMPS)**

Nominal Area of Conductor Sq. mm	PVC Cables		HR PVC Cables	
	Copper	Aluminium	Copper	Aluminium
1.5	0.17	0.11	0.16	0.10
2.5	0.29	0.19	0.26	0.17
4	0.46	0.30	0.42	0.28
6	0.69	0.46	0.63	0.41
10	1.20	0.76	1.00	0.69
16	1.80	1.20	1.70	1.10
25	2.90	1.90	2.60	1.70
35	4.00	2.70	3.70	2.40
50	5.80	3.80	5.20	3.50
70	8.10	5.30	7.30	4.80
95	10.90	7.20	9.90	6.60
120	13.80	9.10	12.50	8.30
150	17.20	11.40	15.60	10.40
185	21.30	14.00	19.30	12.80
240	27.60	18.20	25.00	16.60
300	34.50	22.70	31.30	20.70
400	46.00	30.30	41.70	27.60
500	57.50	37.90	52.10	34.50
630	72.40	47.70	65.60	43.50
800	92.00	60.60	83.30	55.20
1000	114.90	75.80	104.20	69.00

- 1) Max. Conductor Temperature Prior to short circuit for normal PVC: 70°C  
for HRPVC : 85°C
- 2) Max. Conductor Temperature at the termination of short circuit: 160°C

Formula for calculating the short circuit rating for other duration

$$I_k = \frac{I_1}{\sqrt{k}} \quad \text{where } I_1 = \text{Short circuit rating for one second}$$

$$= \text{Short circuit rating for 'k' second}$$

k = Duration in seconds

The above formula is valid for 'k' from 0.2 to 5 seconds

**RATING FACTORS**

IS - 1554 PART -1 - 1988

**RATING FACTORS , FOR AIR AND GROUND TEMPERATURE**

a) RATING FACTOR FOR VARIATION IN AMBIENT AIR TEMPERATURE

AMBIENT TEMP deg C	25.0	30.0	35.0	40.0	45.0	50.0
RATING FACTOR FOR PVC	1.25	1.16	1.09	1.00	0.90	0.81
RATING FACTOR FOR HRPVC	1.15	1.11	1.05	1.00	0.94	0.88

a) RATING FACTOR FOR VARIATION IN GROUND TEMPERATURE

GROUND TEMP deg C	15	20	25.0	30.0	35.0	40.0
RATING FACTORS	1.17	1.12	1.06	1.00	0.94	0.87
RATING FACTOR FOR HRPVC	1.12	1.08	1.04	1.00	0.95	0.90

IS - 1554 PART -1 - 1988

**RATING FACTORS, FOR DEPTH OF LAYING (CABLES LAID DIRECT IN THE GROUND)**

Depth of Laying	SIZE		
	Upto & Including 1.1 kv		
cm	Upto 25 Sq.mm	Above 25 Sq.mm Upto 300 Sq.mm	Above 300 Sq.mm
75	1.00	1.00	1.00
90	0.99	0.98	0.97
105	0.98	0.97	0.96
120	0.97	0.96	0.95
150	0.96	0.94	0.92
180 or more	0.95	0.93	0.91

IS - 1554 PART -1 - 1988

**RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL TWIN & MULTICORE CABLES LAID DIRECT IN THE GROUND**

Nominal Area of Conductor	For value of thermal resistivity of soil in deg C cm/w					
	100	120	150	200	250	300
<b>Sqmm</b>						
1.5	1.10	1.05	1.00	0.92	0.86	0.81
2.5	1.10	1.05	1.00	0.92	0.86	0.81
4	1.10	1.05	1.00	0.92	0.86	0.81
6	1.10	1.05	1.00	0.92	0.86	0.81
10	1.10	1.06	1.00	0.92	0.85	0.80
16	1.12	1.06	1.00	0.91	0.84	0.79
25	1.14	1.08	1.00	0.91	0.84	0.78
35	1.15	1.08	1.00	0.91	0.84	0.77
50	1.15	1.08	1.00	0.91	0.84	0.77
70	1.15	1.08	1.00	0.90	0.83	0.76
95	1.15	1.08	1.00	0.90	0.83	0.76
120	1.17	1.09	1.00	0.90	0.82	0.76
150	1.17	1.09	1.00	0.90	0.82	0.76
185	1.18	1.09	1.00	0.89	0.81	0.75
240	1.18	1.09	1.00	0.89	0.81	0.75
300	1.18	1.09	1.00	0.89	0.81	0.75
400	1.19	1.10	1.00	0.89	0.81	0.75
500	1.19	1.10	1.00	0.89	0.81	0.75
630	1.19	1.10	1.00	0.89	0.81	0.75

**IS - 1554 PART -1 - 1988 RATING FACTORS FOR VARIATIONS IN THERMAL RESISTIVITY OF SOIL (TWO & THREE SINGLE CORE CABLES LAID DIRECT IN GROUND)**

Nominal Area of Conductor	TWO CABLES TOUCHING, FOR VALUES OF THERMAL RESISTIVITY OF SOIL IN degC cm/w						THREE CABLES TREFOIL TOUCHING, FOR VALUES OF THERMAL RESISTIVITY OF SOIL IN degC cm/w					
	100	120	150	200	250	300	100	120	150	200	250	300
<b>Sqmm</b>												
1.5	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.9	0.82	0.76
2.5	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.9	0.82	0.76
4	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.9	0.82	0.76
6	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.9	0.82	0.76
10	1.15	1.08	1.00	0.90	0.83	0.77	1.18	1.09	1.00	0.89	0.81	0.74
16	1.17	1.09	1.00	0.90	0.83	0.77	1.19	1.09	1.00	0.89	0.81	0.74
25	1.18	1.09	1.00	0.90	0.82	0.76	1.19	1.09	1.00	0.88	0.80	0.74
35	1.18	1.09	1.00	0.90	0.82	0.75	1.20	1.09	1.00	0.88	0.80	0.74
50	1.18	1.09	1.00	0.90	0.82	0.75	1.20	1.09	1.00	0.88	0.80	0.74
70	1.19	1.09	1.00	0.89	0.81	0.74	1.21	1.10	1.00	0.88	0.80	0.74
95	1.19	1.09	1.00	0.89	0.81	0.74	1.22	1.10	1.00	0.88	0.80	0.74
120	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.74
150	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.73
185	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.73
240	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.73
300	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.72
400	1.21	1.10	1.00	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
500	1.21	1.10	1.00	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
630	1.22	1.10	1.00	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72

IS : 1554 PART - 1 -1988  
GROUP RATING FACTORS

A) FOR SINGLECORE CABLE LAID IN TREFOIL FORMATION

NO OF TREFOIL IN GROUPS	SPACING BETWEEN TREFOILS			
	TOUCHING	15 cms	30 cms	45 cms
2	0.78	0.81	0.85	0.88
3	0.68	0.71	0.77	0.81
4	0.61	0.65	0.72	0.76
5	0.56	0.61	0.68	0.73

B) CABLES LAID IN TREFOIL DUCT IN HORIZONTAL FORMATION

NO OF TREFOIL IN GROUPS	SPACING BETWEEN TREFOILS		
	TOUCHING	45 cms	60cms
2	0.87	0.90	0.91
3	0.79	0.83	0.86
4	0.74	0.79	0.82
5	0.71	0.76	0.8

C) cables laid in racks / trays in covered trench with removable covers where air circulation is restricted, trefoils are separated by two cable dia horizontally and the trays are in tiers with 30 cm. Gap between them.

NO OF RACK / TRAYS IN TIERS	NO OF TREFOIL IN HORIZONTAL FORMATION		
	1	2	3
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

D) CABLES LAID AS IN 'C' BUT IN OPEN AIR

1	1.00	0.98	0.96
2	1.00	0.95	0.93
3	1.00	0.94	0.92
6	1.00	0.93	0.90

IS : 1554 PART - 1 -1988  
GROUP RATING FACTORS FOR MULTICORE CABLES

A) Cables Laid Inside concrete trench with removable covers, on cable trays where air circulation is restricted. the cables spaced by one cable diameter and tray in tiers by 300 mm. The Clearance of The Cable from the wall Is 25 mm.

No. of Cable Traces In Tier	No. of Cable				
	1	2	3	6	9
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

B) Cable Laid on cable tray exposed to air, the cable spaced by one cable diameter and Trays in tier by 300 mm. The clearance between the wall and the cable is 25mm.

No. of Cable Traces In Tier	No. of Cable				
	1	2	3	6	9
1	1.00	0.98	0.96	0.93	0.92
2	1.00	0.95	0.93	0.90	0.89
3	1.00	0.94	0.92	0.89	0.88
6	1.00	0.93	0.90	0.87	0.86

C) Cables Laid on cable cable trays expoed to air, the cables touching and trays in tiers by 300 mm. The clearance between the wall and the cable 25 mm.

No. of Trays	No. of Cable Per Tray				
	1	2	3	6	9
1	1.00	0.84	0.80	0.75	0.73
2	1.00	0.80	0.76	0.71	0.69
3	1.00	0.78	0.74	0.70	0.68
6	1.00	0.76	0.72	0.68	0.66

D) Cables laid direct in Ground in Horizontal Formation

No. of Trefoil in Groups	SPACE BETWEEN TREFOILS			
	TOUCHING	15 cms	30 cms	45 cms
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

E) CABLES LAID IN SINGLE WAY DUCT/PIPES IN HORIZONTAL

No. of Trefoil in Groups	SPACE BETWEEN TREFOILS			
	TOUCHING	30 cms	45 cms	60 cms
2	0.88	0.90	0.92	0.94
3	0.82	0.84	0.87	0.89
4	0.77	0.80	0.84	0.87
5	0.74	0.78	0.82	0.85
6	0.71	0.76	0.81	0.84

GUIDE LINES FOR LAYING OF SBEE CABLES

- Recommended minimum bending radius of 1.1kv Grade Cable for Fixed Installation.  
Single Core - 15 D  
Multi Core – 12 D  
Where 'D' is overall Diameter of cable.
- Maximum Permissible Tensile strength for cable
  - For Cables pulled with Stocking  
ARMOURED CABLES  $P = 9 D^2$   
UNARMOURED CABLES  $P = 5 D^2$   
Where P = pulling force in Newtons  
D = outer Diameter of cable.
  - For Cables pulled by pulling eye: - If the cables are pulled by gripping the conductor directly with pulling eye, the Maximum permissible Tensile stress depends on the Material of the Conductor and their cross section as given below: -  
For Aluminium Conductors = 30 N/mm<sup>2</sup>  
For Copper Conductors = 50 N/mm<sup>2</sup>

**HANDLING AND STORAGE OF CABLE DRUMS**

- a) The cable drums or coils must not be dropped or thrown from railway wagons or trucks during unloading operation. A RAMP or Crane may be used for unloading cable drums. If neither of them is available, a temporary ramps with inclination 1 : 3 to 1 : 4 approximately should be constructed, the cable drum should then be rolled over the ramp by means of ropes and winches. Additionally a sand bed at the root of the ramp may be made to break the rolling back of cable drums.
- b) The arrows painted on the flange of the drum indicate the direction in which the drum should be rolled. The cable will unwind and become loose if the drum is rolled in the opposite direction.
- c) The site chosen for storage of cable drums should be well drained and should preferably have a concrete surface / firm surface which will not cause the drums to sink and thus lead to flange rot and extremely difficult in moving the drums & inturn avoiding damage to the cable.
- d) All drums should be stored in such a manner as to leave sufficient space between them for air circulation. It is desirable for the drums to stand on battens placed directly under the flanges. During storage the drum should be rolled to an angle of 90° once every three months.
- e) In no case should the drums be stored on the flat i.e., with flange horizontally placed.
- f) Overhead covering is not essential unless the storage is for a long period. The cable should however, be protected from direct rays of the sun by leaving the outer battens on or by providing some form of Sun shielding.
- g) Do not rewind cable to another drum. Whose barrel diameter is less than the existing drum diameter.

**NOTE: All data given in this catalogue is approximate and are subject to manufacturing tolerance  
 Delivery length tolerance ± 5% length more than normal as per customer request.  
 All figures given in various tables are indicative only.**

**LAB @ SBEE**





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Dealer