



# WIRE & CABLES



# Product Range

- ▶ **LT Copper / Aluminium Power Cables  
XLPE/ PVC 1.1 KV**
- ▶ **LT Copper Control Cables XLPE/PVC 1.1 KV**
- ▶ **Instrumentation Cables Screened & Unscreened  
(PVC/XLPE/LDPE/PE)**
- ▶ **Telecommunication & Switch Board Cables**
- ▶ **Fire Retardant & Fire Survival Cables  
(FR/FRLS/HRFR/LSZH/FRZH)**
- ▶ **House Wires**
- ▶ **Flexible Multicore Cables**
- ▶ **Submersible Flat Cables**
- ▶ **Thermocouple Compensating &  
Extension Cables.**
- ▶ **Solar Cables**
- ▶ **Rubber Cables**



# Contents

	<b>3</b>
<b>Advantages of XLPE Cables &amp; Selection</b>	<b>4</b>
<b>Conductor Data</b>	<b>5</b>
<b>Technical Data of PVC Cables</b>	<b>6-17</b>
<b>Technical Data of XLPE Cables</b>	<b>18-28</b>
<b>Technical Data of Control Cables PVC/XLPE</b>	<b>29-32</b>
<b>Flexible Wire &amp; Cables</b>	<b>33-36</b>
<b>Solar Cables</b>	<b>37</b>
<b>Instrumentation Cables</b>	<b>38-39</b>
<b>Fire Survival Cables</b>	<b>40</b>
<b>Rubber Cables</b>	<b>41</b>
<b>Lab equipment and Machinery</b>	<b>42-43</b>
<b>Handling and Storage</b>	<b>44</b>



# WIRE & CABLES

# ISO 14001:2015

## Certificate of Registration



This is to Certify That The Environmental Management System of

**TORTEK INDIA PRIVATE LIMITED**

G-1/1023, RHICO INDUSTRIAL AREA, BHIWADI, ALWAR, RAJSTAHAN – 301019, INDIA.

has been audited and conformed to be in accordance with the requirements of

### ISO 14001:2015

The Environmental Management System is Applicable to :

MANUFACTURE OF WIRE AND CABLES.

Certificate No	: EBX401019	Issuance Date	: 22/10/2019
Initial Registration Date	: 22/10/2019	Date of Expiry*	: 21/10/2022
1st Surve. Due	: 22/09/2020	2nd Surve. Due	: 22/09/2021

Director



ACCREDITED  
Management Systems  
Certification Body  
MSCB-174



**Aambitious Assessment Pvt. Ltd.**

804, Ashok Bhawan, Building No. 93, Nehru Place, New Delhi - 110 019, India.

e-mail: [info@aapcertification.in](mailto:info@aapcertification.in), website: [www.aapcertification.in](http://www.aapcertification.in)

Certificate Verification: Certificate Validity can be re-checked at [www.aapcertification.in](http://www.aapcertification.in)

This certificate is a property of Aambitious Assessment Pvt. Ltd. and shall be returned immediately when demanded

\*Validity of the certificate is subject to successful completion of surveillance audit on or before due date



## Company Profile

“Tortek India Pvt. Ltd.” is a leading name in the field of Industrial & Domestic Wires & Cables. We offer extensive expertise in design, development and manufacturing of high quality Power, Control, Instrumentation Cables along with House Wires & Flexible Cables & we supply products as per Customer Specifications. Conforming to Indian/ International Standards. Like: - BIS, IEC, VDE, BS etc.

Our mission is to strive for growth in new and existing markets and provide cost-effective and quality solutions for the electrical connectivity requirements by offering high quality, customized cables at lowest price, and with best service and unfailing commitment.

Tortek has a centralized testing laboratory with latest testing equipments. The quality assurance system ensures the quality of product at every stage right from raw material upto finished product. The company has been accredited with ISO:9001-2008 with DAC.

Excellent Quality of Cables is maintained by strict quality control at each and every stage of manufacturing and by virtue of severe tests conducted as per the relevant specifications at our Laboratory under the supervision of quality engineers. We adopt a modern approach in terms of Technology and Capability for maintaining standard of quality.

The Company is manned by a team of highly experienced, qualified engineers and professionals, technicians, testing experts, quality checkers and management peoples who puts their constant efforts to provide the best range of high quality wires & cables to large numbers of clients.

Tortek India Pvt. Ltd. has all integrated manufacturing facilities including wire drawing, stranding, insulation lines, braiding, armoring & sheathing for LT Power, Control, Instrumentation and Telecommunication cables conforming to Indian & International Standards such as BS, IEC, VDE as well as various Customer Specification. We at Tortek Cables also hold BIS Certifications for all types of Cables conforming to IS: 1554/P-1/88, IS: 7098/P-1/88 and IS: 694 – 1990/2010.

### Our Distribution Network:

Tortek india Pvt Ltd is regularly supplying & provides best services to their esteemed customers having spread in different segments such as Power & Distribution, Sugar Industries, Automobile Industries, Cement, Fertilizers, Oil & gas including Refineries, EPC Divisions, Telecom, Steel, Petrochemicals , pharmaceutical etc.

### Tortek Overseas Presence:

We regularly export Tortek make cables Dubai, Egypt, U.A.E, Qatar, Taiwan, Maldives, Iran, Singapore, Iraq & Nepal.





## WIRE & CABLES

### CROSS LINKED POLYETHENE (XLPE)

XLPE means cross-linked polyethylene or vulcanized polyethylene. The basic material is low density polyethylene. Polyethylene is a thermoplastic material consisting of long chain of hydrocarbon molecules. At elevated temperatures these molecules tend to move relative to one another so that the material becomes increasingly deformable and will eventually melt at the temperature around 110°C.

By means of process similar to the vulcanization of rubber the polyethylene molecules can be cross-linked. The process of cross of linking or vulcanization consists of producing chemical bonds at interval the long molecular chain to give a “ladder” effect which prevents slippage between molecules. As a result of cross-linking the material becomes heat resistant and does not soften at higher temperatures. Further it has better resistance to stress cracking and good resistance to ageing in hot air. With the change of structure there is no adverse effect on electrical properties.

#### Advantages of “TORTEK CABLES” XLPE CABLES

Dielectric losses are very small.
Higher current carrying capacity.
Higher short circuit rating 250°C. as against 160°C for PVC.
XLPE can retain flexibility down upto - 40°C.
Jointing and Termination is easy.
Light in weight.
They are not prone to fatigue damages due to vibrations or loading cycles.
Has better resistance to most chemicals, oils, acids, etc.
Can be installed along cable routes without elevation limitations.



#### Comparison of main properties between PVC and XLPE insulation

Characteristics	Unit	PVC	XLPE
Permittivity (50Hz. 20°C)	-	4-6	2.3
Dielectric Loss Factor (50Hz. 20°C)	-	0.05-0.07	0.0004
Volume Resistivity (27°C)	ohms cm (min.)	10 <sup>13</sup>	10 <sup>14</sup>
Max. Conductor Temperature	°C	70	90
Max. Short Circuit Temperature	°C	160	250
Tensile Strength	N / mm <sup>2</sup> (min.)	12.5	12.5
Elongation at break	-	Excellent	Medium
Flexibility at - 10°C	-	Poor	Good
Resistance to abrasion	-	Medium	Good

## CONDUCTOR DATA

**Conductor Technical Data for Single Core and Multicore cables conforming to IS-8130/1984  
(Stranded-Class-2) Aluminium Conductors and Annealed copper conductors, Compacted Circular /  
Non Compacted Circular**

Nominal Size Conductor	Minimum No. of Wires				Max DC Resistance at 20°C		AC Resistance at 70°C		AC Resistance at 90°C	
	Non-Compacted		Compacted		Plain Copper	Aluminium	Plain Copper	Aluminium	Plain Copper	Aluminium
Sq.mm	Cu	Al	Cu	Al	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km
1.5	3	3	-	-	12.10	18.10	14.50	21.72	15.50	23.17
2.5	3	3	-	-	7.41	12.10	8.87	14.52	9.48	15.50
4	7	3	-	-	4.61	7.41	5.52	8.89	5.90	9.48
6	7	3	-	-	3.08	4.61	3.69	5.53	3.94	5.90
10	7	7	6	-	1.83	3.08	2.19	3.70	2.34	3.94
16	7	7	6	6	1.15	1.91	1.38	2.29	1.47	2.44
25	7	7	6	6	0.727	1.20	0.87	1.44	0.93	1.54
35	7	7	6	6	0.524	0.868	0.627	1.04	0.671	1.11
50	19	19	6	6	0.387	0.641	0.463	0.77	0.495	0.82
70	19	19	12	12	0.268	0.443	0.321	0.53	0.343	0.567
95	19	19	15	15	0.193	0.320	0.231	0.38	0.247	0.410
120	37	37	18	15	0.153	0.253	0.184	0.30	0.196	0.324
150	37	37	18	15	0.124	0.206	0.149	0.25	0.159	0.264
185	37	37	30	30	0.0991	0.164	0.120	0.20	0.127	0.210
240	61	37	34	30	0.0754	0.125	0.091	0.15	0.0965	0.160
300	61	61	34	30	0.0601	0.100	0.073	0.12	0.0769	0.128
400	61	61	53	53	0.0470	0.0778	0.059	0.0930	0.0602	0.100
500	61	61	53	53	0.0366	0.0605	0.046	0.0726	0.0468	0.0774
630	91	91	53	53	0.0283	0.0469	0.037	0.0563	0.0362	0.0600
800	91	91	53	53	0.0221	0.0367	0.031	0.0440	0.0283	0.0470
1000	91	91	53	53	0.0176	0.0291	0.027	0.0349	0.0225	0.0372





## SHORT CIRCUIT CURRENT RATINGS FOR XLPE/PVC CABLES

Short Circuit Rating for 1 second duration for XLPE & PVC Insulated Cables with Copper and Aluminium Cables (Isc Current in KAmps)

Nominal Size Sq. mm	XLPE Insulates		PVC Insulates	
	Copper	Aluminium	Copper	Aluminium
1.5	0.21	-	0.173	-
2.5	0.36	-	0.283	*
4	0.57	0.38	0.46	0.303
6	0.86	0.57	0.69	0.455
10	1.40	0.94	1.15	0.758
16	2.30	1.50	1.84	1.21
25	3.60	2.40	2.88	1.90
35	5.00	3.30	4.03	2.65
50	7.10	4.70	5.75	3.79
70	10.0	6.60	8.05	5.31
95	13.6	9.00	10.9	7.20
120	17.1	11.3	13.8	9.10
150	21.4	14.2	17.3	11.40
185	26.4	17.5	21.3	14.02
240	34.3	22.6	27.6	18.20
300	42.9	28.3	34.5	22.80
400	57.1	37.7	46.0	30.40
500	71.4	47.2	57.5	38.00
630	90.0	59.4	72.5	47.25
800	114.3	75.5	92.0	60.00
1000	142.9	94.3	115.0	75.00

### Rating for any other duration:

1. Max. Initial Conductor Temperature during operation:

XLPE	PVC
90°C	70°C

2. Max. Final Conductor Temperature during short circuit:

XLPE	PVC
250°C	160°C

Formula relating short Circuit Rating with t second duration

$$I_t = \frac{I_{sc}}{\sqrt{t}}$$

Where  $I_t$  = short Circuit Rating for t seconds.  
 $t$  = duration in seconds.  
 $I_{sc}$  = short circuit rating for 1 second.

PVC Type 'A' Insulation as per IS-5831 - 1984.

PVC Cables as per IS -1554 (P-I) 1988.

XL PE Cables as per IS - 7098 (P-I) 1988.

### Comparative Current Rating of 650/1100 Volts Multicore heavy duty PVC Insulated Cable & XLPE Insulated Cables 3,3.5 & 4 Core Unarmoured / Armoured PVC Sheathed Cables with Aluminium Conductor.

Nominal Size Cable Sq.mm	3, 3.5 & 4 Core PVC Insulated & Sheathed Cables as per IS - 1554 (P-I) 1988			3, 3.5 & 4 Core XLPE Insulated & Sheathed Cables as per IS - 7098 (P-I) 1988		
	In Ground Amp	In Air Amp	Approx Voltage Drop Mv/amp/mtr	In Ground Amp	In Air Amp	Approx Voltage Drop Mv/amp/mtr
16	60	51	4.0	73	70	4.2
25	76	70	2.5	94	96	2.7
35	92	86	1.8	113	117	1.9
50	110	105	1.3	133	142	1.4
70	135	130	0.93	164	179	0.99
95	165	155	0.68	196	221	0.72
120	185	180	0.54	223	257	0.58
150	210	205	0.46	249	292	0.48
185	235	240	0.38	282	337	0.39
240	275	280	0.28	327	399	0.31
300	305	315	0.25	367	455	0.26
400	335	375	0.2	420	530	0.21



## CURRENT RATINGS (PVC)

**The current rating in table 1 & 2 based on the normal conditions of installation as described below:**

1. Maximum conductor temperature	70°C	5. Thermal resistivity of soil	150°C cm/watt
2. Ambient air temperature	40°C	6. Thermal resistivity of cable	650°C cm/watt
3. Ground temperature	30°C	7. Max. short-circuit conductor temperature	160°C
4. Depth of laying (for cable laid directly in ground)	75 cm (1.1 KV)	8. Max. Ambient Air Temperature	55°C

**Installation method and rating factors are given in tables 1 to 6.**

**Table 1**

**Rating for variations in ground temperature for cables laid directly in ground and in ducts**

Ground temperature °C	15	20	25	30	35	40	45	50	55
Rating factor	1.17	1.12	1.06	1.0	0.94	0.87	0.79	0.70	0.60

**Table 2**

**Rating for variations in ambient air temperature**

Air temperature °C	25	30	35	40	45	50	55
Rating factor	1.25	1.16	1.09	1.00	0.90	0.80	0.69

**Table 3**

**Rating factor of groups of twin and multicore cables laid directly in ground in horizontal formation**

No. of cables	Rating factor for axial spacing				
	Touching	15 cm	30 cm	45 cm	60 cm
2 Cables	0.78	0.81	0.85	0.88	0.90
3 Cables	0.68	0.71	0.77	0.81	0.83
4 Cables	0.61	0.65	0.72	0.76	0.79
6 Cables	0.53	0.58	0.66	0.71	0.76
8 Cables	0.48	0.54	0.62	0.67	0.72

**Table 4**

**Rating factor of groups of twin and multicore cables laid directly in ground in tier formation**

No. of cables	Rating factor for axial spacing				
	Touching	15 cm	30 cm	45 cm	60 cm
4 Cables	0.60	0.67	0.73	0.76	0.78
6 Cables	0.51	0.57	0.63	0.67	0.69
8 Cables	0.45	0.51	0.57	0.59	0.61

**Table 5**

**Rating factors for variation in depth of laying in ground**

Depth of laying (cms)	75	90	105	120	150	150 & above
Rating factor upto 25 sq. mm.	1.00	0.99	0.98	0.97	0.96	0.95

**Table 6**

**Group-rating factors for cables installed in ground, separated by more than 7 cms**

No. of cables	1	2	3	4	5	6
Single core D.C. & Multicore Power cables	1.0	0.90	0.80	0.75	0.70	0.65
Single core A.C. cables	1.0	0.80	0.75	0.70	0.65	0.60

# 1 CORE ALUMINIUM PVC ARMoured & UNARMoured POWER CABLES (AYWY/AYFY/AYY)

No. of cores & cross sectional area	Min. No. of Wires	ARMoured					UNARMoured				Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	ARMoured		UNARMoured		CURRENT RATINGS					
		Thick-ness of PVC insula-tion (Nom.)	Nomi-nal Dimen-sions of Armour Wire	Min. Thick-ness of PVC Outer Sheath	Overall Diam-eter (Ap-prox.)	Approx. Net Wt. of Cable	Thick-ness of PVC insula-tion (Nom.)	Nomi-nal Thick-ness of PVC Outer Sheath	Overall Diam-eter (Ap-prox.)	Approx. Net Wt. of Cable			Approx. Reac-tance at 50 Hz	Approx. Capaci-tance	Approx. Reac-tance at 50 Hz	Approx. Capaci-tance	Direct in Ground		In Duct		In Air	
																	2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables
(mm)	(mm)	(mm)	(mm)	(Kg/ Km)	(mm)	(mm)	(mm)	(Kg/ Km)	Ohms/ Km	Ohms/ Km	Ohms/ Km	mfd/Km	Ohms/ Km	mfd/Km	Amps	Amps	Amps	Amps	Amps	Amps		
ICX4	1	1.3	1.4	1.24	10.9	148	1.0	1.8	8.6	89	7.4100	8.8900	0.158	0.47	0.137	0.58	36	31	33	30	32	27
ICX6	1	1.3	1.4	1.24	11.4	165	1.0	1.8	9.1	103	4.6100	5.5300	0.148	0.56	0.127	0.68	44	39	42	37	41	35
ICX10	1	1.3	1.4	1.24	12.3	196	1.0	1.8	10.1	127	3.0800	3.7000	0.138	0.67	0.118	0.83	59	51	56	51	56	47
ICX16	6	1.3	1.4	1.24	13.1	225	1.0	1.8	10.8	152	1.9100	2.2900	0.128	0.81	0.110	1.01	75	66	71	65	72	64
ICX25	6	1.5	1.4	1.24	14.7	287	1.2	1.8	12.4	204	1.2000	1.4400	0.120	0.87	0.105	1.05	97	86	93	84	99	84
ICX35	6	1.5	1.4	1.24	15.7	334	1.2	1.8	13.4	244	0.8680	1.0400	0.114	1.00	0.100	1.22	120	100	110	100	120	105
ICX50	6	1.7	1.4	1.24	17.2	411	1.4	1.8	14.9	310	0.6410	0.7700	0.110	1.03	0.098	1.22	145	120	130	115	150	130
ICX70	12	1.7	1.4	1.40	19.1	513	1.4	1.8	16.5	388	0.4430	0.5300	0.103	1.21	0.091	1.43	175	140	155	135	185	155
ICX95	15	1.9	1.6	1.40	21.6	662	1.6	1.8	18.6	501	0.3200	0.3800	0.101	1.27	0.088	1.47	210	175	192	155	215	190
ICX120	15	1.9	1.6	1.40	23.7	784	1.6	2.0	21.1	621	0.2530	0.3000	0.096	1.42	0.086	1.62	240	195	200	170	240	220
ICX150	15	2.1	1.6	1.40	24.8	898	1.8	2.0	22.2	726	0.2060	0.2500	0.094	1.42	0.085	1.62	270	220	220	190	270	250
ICX185	30	2.3	1.6	1.40	27.1	1069	2.0	2.0	24.5	884	0.1640	0.2000	0.092	1.44	0.084	1.62	305	240	240	210	305	290
ICX240	30	2.5	1.6	1.56	30.2	1337	2.2	2.0	27.3	1106	0.1250	0.1500	0.090	1.53	0.082	1.72	335	270	270	225	350	335
ICX300	30	2.7	1.6	1.56	35	1676	2.4	2.0	29.8	1336	0.1000	0.1200	0.088	1.56	0.080	1.74	370	295	295	245	395	380
ICX400	53	3.0	2.0	1.56	37.1	2032	2.6	2.2	33.6	1690	0.0778	0.0934	0.088	1.56	0.080	1.81	410	325	335	275	455	435
ICX500	53	3.4	2.0	1.72	41.2	2531	3.0	2.2	37.4	2120	0.0605	0.0726	0.087	1.57	0.079	1.76	435	345	355	295	490	480
ICX630	53	3.9	2.0	1.88	46.2	3183	3.4	2.4	42.2	2709	0.0469	0.0567	0.086	1.57	0.077	1.77	485	390	395	320	560	550
ICX800	53	3.9	2.0	1.88	52.0	4120	3.4	2.4	48.0	3430	0.0367	0.0440	0.083	1.75	0.077	1.98	525	442	420	350	640	600
ICX1000	53	3.9	2.5	2.04	57.3	4812	3.4	2.6	52.2	4064	0.0291	0.0349	0.082	1.94	0.076	2.20	570	485	445	380	740	720



# 1 CORE COPPER PVC ARMoured & UNARMoured POWER CABLES (YWY/YFY/YY)

No. of cores & cross sectional area	Min. No. of Wires	ARMoured					UNARMoured					Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	ARMoured		CURRENT RATINGS					
		Thick-ness of PVC insula-tion (Nom.)	Nominal Dimen-sions of Armour Wire	Min. Thick-ness of PVC Outer Sheath	Overall Diam-eter (Ap-prox.)	Approx. Net Wt. of Cable	Thick-ness of PVC insula-tion (Nom)	Nominal Thick-ness of PVC Outer Sheath	Overall Diam-eter (Ap-prox.)	Approx. Net Wt. of Cable	Approx. React-ance at 50 Hz			Approx. Capaci-tance	Direct in Ground		In Duct		In Air		
															2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables	
(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(mm)	(mm)	(mm)	(Kg/Km)	Ohms/ Km	Ohms/ Km	Ohms/ Km	mfd/Km	Amps	Amps	Amps	Amps	Amps	Amps			
ICX4	1.0	1.3	1.4	1.24	10.9	173	1.00	1.80	8.6	114	4.61	5.52	0.158	0.47	46	39	42	38	43	35	
ICX6	1.0	1.3	1.4	1.24	11.4	204	1.00	1.80	9.1	142	3.08	3.69	0.148	0.56	57	49	54	48	54	44	
ICX10	6.0	1.3	1.4	1.24	12.3	259	1.00	1.80	10.1	190	1.83	2.19	0.138	0.67	75	65	72	64	72	60	
ICX16	6.0	1.3	1.4	1.24	13.1	320	1.00	1.80	10.8	248	1.15	1.38	0.128	0.81	94	85	92	83	92	82	
ICX25	6.0	1.5	1.4	1.24	14.7	440	1.20	1.80	12.4	358	0.727	0.87	0.120	0.87	125	110	120	110	125	110	
ICX35	6.0	1.5	1.4	1.24	15.7	548	1.20	1.80	13.4	458	0.524	0.627	0.114	1.00	150	135	140	125	155	130	
ICX50	6.0	1.7	1.4	1.24	17.2	696	1.40	1.80	14.9	595	0.387	0.463	0.110	1.03	180	155	165	150	190	165	
ICX70	12.0	1.7	1.4	1.40	19.1	930	1.40	1.80	16.5	805	0.268	0.321	0.103	1.21	220	190	200	175	235	205	
ICX95	15.0	1.9	1.6	1.40	21.6	1243	1.60	1.80	18.6	1081	0.193	0.231	0.101	1.27	265	220	230	200	275	245	
ICX120	18.0	1.9	1.6	1.40	23.7	1515	1.60	2.00	21.1	1332	0.153	0.184	0.096	1.42	300	250	255	220	310	280	
ICX150	18.0	2.1	1.6	1.40	24.8	1802	1.80	2.00	22.2	1630	0.124	0.149	0.094	1.42	340	280	280	245	345	320	
ICX185	30.0	2.3	1.6	1.40	27.1	2198	2.00	2.00	24.5	2013	0.0991	0.12	0.092	1.44	380	305	305	260	390	370	
ICX240	34.0	2.5	1.6	1.56	30.2	2822	2.20	2.00	27.3	2592	0.0754	0.091	0.090	1.53	420	345	340	285	445	425	
ICX300	34.0	2.7	1.6	1.56	35	3542	2.40	2.00	29.8	3202	0.0601	0.074	0.088	1.56	465	375	370	310	500	475	
ICX400	53	3.0	2.0	1.56	37.1	4412	2.60	2.20	33.6	4070	0.0470	0.059	0.088	1.56	500	400	405	335	570	550	
ICX500	53	3.4	2.0	1.72	41.2	5585	3.00	2.20	37.4	5175	0.0366	0.046	0.087	1.57	540	425	430	355	610	590	
ICX630	53	3.9	2.0	1.88	46.2	7138	3.40	2.40	42.2	6664	0.0283	0.037	0.086	1.57	590	470	465	375	680	660	
ICX800	53	3.9	2.0	1.88	52.0	9000	3.40	2.40	48.0	8248	0.0221	0.031	0.083	1.75	664	530	523	425	766	743	
ICX1000	53	3.9	2.5	2.04	57.3	11167	3.40	2.60	52.2	10419	0.0176	0.027	0.082	1.94	733	585	579	467	856	830	



## 2 CORE ALUMINIUM PVC ARMoured & UNARMoured POWER CABLES (AYWY/AYFY/AYY)

No. of core & cross sectional area	Min. No. of Wires	Thickness of PVC insulation (Nom.) mm	Min Thickness of Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath mm	Overall Diameter (Approx) mm	Net Wt. of Cable (Approx) Kg/Km					Direct in Ground Amps	In Duct Amps	In Air Amps
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg. Km)	Wire (Kg. Km)										
2Cx1.5	1	0.80	0.30	-	1.40	-	1.24	-	13.5	-	390	1.80	10.40	170	18.10	21.72	0.126	0.140	18	16	16
2Cx2.5	1	0.90	0.30	-	1.40	-	1.24	-	15.0	-	450	1.80	11.90	210	12.10	14.52	0.119	0.150	25	21	21
2Cx4	1	1.00	0.30	-	1.40	-	1.24	-	16.5	-	550	1.80	13.40	265	7.41	8.89	0.116	0.160	32	27	27
2Cx6	1	1.00	0.30	-	1.40	-	1.24	-	17.5	-	640	1.80	14.40	320	4.61	5.53	0.110	0.190	40	34	35
2Cx10	1	1.00	0.30	-	1.40	-	1.24	-	19.0	-	745	1.80	15.90	390	3.08	3.70	0.100	0.220	55	45	47
2Cx16	6	1.00	0.30	4x0.8	1.60	1.40	1.40	18.8	20.4	528	723	1.80	18.00	338	1.91	2.29	0.097	0.290	70	58	59
2Cx25	6	1.20	0.30	4x0.8	1.60	1.40	1.40	20.8	22.4	658	887	2.00	20.40	461	1.20	1.44	0.097	0.320	90	76	78
2Cx35	6	1.20	0.30	4x0.8	1.60	1.40	1.40	21.8	23.4	747	976	2.00	21.40	537	0.868	1.04	0.097	0.370	110	92	99
2Cx50	6	1.40	0.30	4x0.8	1.60	1.40	1.56	24.3	26.2	923	1198	2.00	23.90	683	0.641	0.77	0.094	0.370	135	115	125
2Cx70	12	1.40	0.30	4x0.8	1.60	1.56	1.56	26.7	28.3	1124	1411	2.00	26.00	838	0.443	0.53	0.090	0.440	160	140	150
2Cx95	15	1.60	0.40	4x0.8	2.00	1.56	1.56	30.2	32.6	1411	1915	2.20	29.90	1107	0.320	0.38	0.090	0.440	190	170	185
2Cx120	15	1.60	0.40	4x0.8	2.00	1.56	1.72	31.7	34.4	1613	2170	2.20	31.40	1291	0.253	0.30	0.087	0.490	210	190	210
2Cx150	15	1.80	0.40	4x0.8	2.00	1.72	1.72	35.4	37.8	1948	2553	2.40	35.20	1592	0.206	0.25	0.087	0.490	240	210	240
2Cx185	30	2.00	0.50	4x0.8	2.00	1.88	1.88	39.1	41.5	2357	3013	2.40	38.50	1933	0.164	0.20	0.087	0.490	275	240	275
2Cx240	30	2.20	0.50	4x0.8	2.50	2.04	2.04	42.5	45.9	2880	3908	2.60	42.00	2424	0.125	0.15	0.087	0.500	320	275	325
2Cx300	30	2.40	0.60	4x0.8	2.50	2.20	2.20	48.5	51.9	3500	4675	2.80	48.10	2981	0.100	0.12	0.086	0.520	355	305	365
2Cx400	53	2.60	0.70	4x0.8	3.15	2.36	2.52	55.5	60.5	4560	6560	3.20	52.50	3755	0.0778	0.09	0.086	0.530	385	345	420



## 2 CORE COPPER PVC ARMoured & UNARMoured POWER CABLES (YWy/YFY/YY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insula-tion (Nom.) mm	Min Thick-ness of Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resis-tance at 20°C Ohms/ Km	Max. A.C. Resis-tance at 70°C Ohms/ Km	Approx Reac-tance at 50 Hz Ohms/ km	Approx Capac-i-tance mfd/km	CURRENT RATINGS		
				Nominal dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg. Km)	Wire (Kg. Km)										
2Cx1.5	1	0.80	0.30	-	1.40	-	1.24	-	13.5	-	407	1.80	10.40	194	12.1	14.5	0.126	0.14	23	20	20
2Cx2.5	1	0.90	0.30	-	1.40	-	1.24	-	15.0	-	482	1.80	11.90	248	7.4	8.87	0.119	0.15	32	27	27
2Cx4	1	1.00	0.30	-	1.40	-	1.24	-	16.5	-	596	1.80	13.40	316	4.6	5.52	0.116	0.16	41	35	35
2Cx6	1	1.00	0.30	-	1.40	-	1.24	-	17.5	-	711	1.80	14.40	397	3.08	3.69	0.110	0.19	50	44	45
2Cx10	6	1.00	0.30	-	1.40	-	1.24	-	19.0	-	863	1.80	15.90	515	1.83	2.19	0.100	0.22	70	58	60
2Cx16	6	1.00	0.30	4x0.8	1.60	1.40	1.40	18.8	20.4	721	917	1.80	18.00	531	1.115	1.38	0.097	0.29	90	75	78
2Cx25	6	1.20	0.30	4x0.8	1.60	1.40	1.40	20.8	22.4	965	1193	2.00	20.40	767	0.722	0.87	0.097	0.32	115	97	105
2Cx35	6	1.20	0.30	4x0.8	1.60	1.40	1.40	21.8	23.4	1176	1405	2.00	21.40	966	0.524	0.627	0.097	0.37	140	120	125
2Cx50	6	1.40	0.30	4x0.8	1.60	1.40	1.56	24.3	26.2	1494	1768	2.00	23.90	1254	0.387	0.463	0.094	0.37	165	145	155
2Cx70	12	1.40	0.30	4x0.8	1.60	1.56	1.56	26.7	28.3	1963	2250	2.00	26.00	1677	0.268	0.321	0.090	0.44	205	180	195
2Cx95	15	1.60	0.40	4x0.8	2.00	1.56	1.56	30.2	32.6	2577	3081	2.20	29.90	2274	0.193	0.231	0.090	0.44	240	215	230
2Cx120	18	1.60	0.40	4x0.8	2.00	1.56	1.72	31.7	34.4	3082	3639	2.20	31.40	2760	0.153	0.184	0.087	0.49	275	235	265
2Cx150	18	1.80	0.40	4x0.8	2.00	1.72	1.72	35.4	37.8	3765	4369	2.40	35.20	3409	0.124	0.149	0.087	0.49	310	270	305
2Cx185	30	2.00	0.50	4x0.8	2.00	1.88	1.88	39.1	41.5	4626	5281	2.40	38.50	4201	0.0991	0.120	0.087	0.49	350	300	350
2Cx240	34	2.20	0.50	4x0.8	2.50	2.04	2.04	42.5	45.9	5865	6893	2.60	42.00	5409	0.0754	0.091	0.087	0.50	405	345	410
2Cx300	34	2.40	0.60	4x0.8	2.50	2.20	2.20	48.5	51.9	7250	8424	2.80	48.10	6732	0.0601	0.073	0.086	0.52	450	385	465
2Cx400	53	2.60	0.70	4x0.8	3.15	2.36	2.52	55.5	60.5	9188	11171	3.20	52.50	8466	0.0470	0.059	0.086	0.53	490	425	530



### 3 CORE ALUMINIUM PVC ARMoured & UNARMoured POWER CABLES (AYWY/AYFY/AYY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insula-tion (Nom.) mm	Min Thick-ness of Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/ Km	Max. A.C. Resistance at 70°C Ohms/ Km	Approx React-ance at 50 Hz Ohms/ km	Approx Capacitance mfd/km	CURRENT RATINGS		
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire										
				mm	mm	mm	mm	mm	mm	mm	mm	Kg. Km)	Kg. Km)								
3Cx1.5	---	0.8	0.3	-	1.40	-	1.24	-	14.0	-	420	1.80	11.00	190	18.10	21.72	0.126	0.14	16	14	13
3Cx2.5	---	0.9	0.3	-	1.40	-	1.24	-	15.0	-	500	1.80	12.00	230	12.10	14.52	0.119	0.15	21	18	18
3Cx4	---	1.0	0.3	-	1.40	-	1.24	-	16.5	-	595	1.80	13.4	300	7.41	8.89	0.116	0.41	28	23	23
3Cx6	---	1.0	0.3	-	1.40	-	1.24	-	17.5	-	685	1.80	14.4	350	4.61	5.53	0.110	0.47	35	30	30
3Cx10	---	1.0	0.3	-	1.40	-	1.40	-	19.5	-	830	1.80	15.6	435	3.08	3.70	0.100	0.56	46	39	40
3Cx16	6	1.0	0.3	4x0.8	1.60	1.40	1.40	18.6	20.2	569	767	1.80	18.4	415	1.91	2.29	0.097	0.76	60	50	51
3Cx25	6	1.2	0.3	4x0.8	1.60	1.40	1.40	21.3	22.9	750	971	2.00	21.5	586	1.20	1.44	0.097	0.86	76	63	70
3Cx35	6	1.2	0.3	4x0.8	1.60	1.40	1.40	23.1	24.7	888	1192	2.00	23.3	705	0.868	1.04	0.097	0.98	92	77	86
3Cx50	6	1.4	0.3	4x0.8	1.60	1.56	1.56	26.6	28.2	1147	1436	2.00	26.5	913	0.641	0.77	0.094	0.02	110	95	105
3Cx70	12	1.4	0.4	4x0.8	2.00	1.56	1.56	29.6	32.0	1426	1914	2.20	29.9	1187	0.443	0.53	0.090	1.18	135	115	130
3Cx95	15	1.6	0.4	4x0.8	2.00	1.56	1.72	33.5	36.2	1915	2420	2.20	33.8	1538	0.320	0.38	0.090	1.20	165	140	155
3Cx120	15	1.6	0.4	4x0.8	2.00	1.72	1.72	37.0	39.4	2166	2796	2.20	37.0	1829	0.253	0.30	0.087	1.31	185	155	180
3Cx150	15	1.8	0.5	4x0.8	2.00	1.88	1.88	40.1	42.4	2584	3249	2.40	40.1	2228	0.206	0.25	0.087	1.31	210	175	205
3Cx185	30	2.0	0.5	4x0.8	2.50	1.88	2.04	44.2	47.9	3099	4246	2.60	44.6	2743	0.164	0.20	0.087	1.31	235	200	240
3Cx240	30	2.2	0.6	4x0.8	2.50	2.20	2.20	50.3	53.7	3945	5171	2.80	50.7	3541	0.125	0.15	0.087	1.34	275	235	280
3Cx300	30	2.4	0.6	4x0.8	2.50	2.36	2.36	55.0	58.4	4731	6085	3.00	55.5	4296	0.100	0.12	0.086	1.41	305	260	315
3Cx400	53	2.6	0.7	4x0.8	3.15	2.52	2.68	62.6	67.6	5927	8135	3.40	63.8	5537	0.0778	0.09	0.086	1.45	335	290	375



WIRE & CABLES

**TORTEK**

## 3 CORE COPPER PVC ARMoured & UNARMoured POWER CABLES (YWy/YFY/YY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insulation (Nom.) mm	Min Thick-ness of Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS		
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg. Km)	Wire (Kg. Km)										
3Cx1.5	1	0.80	0.3	-	1.4	-	1.24	-	14.0	-	442	1.80	11.00	218	12.1	14.5	0.126	0.14	21	17	17
3Cx2.5	1	0.90	0.3	-	1.4	-	1.24	-	15.0	-	542	1.80	12.00	284	7.41	8.87	0.119	0.15	27	24	24
3Cx4	1	1.00	0.3	-	1.4	-	1.24	-	16.5	-	663	1.80	13.50	372	4.61	5.52	0.116	0.41	36	30	30
3Cx6	1	1.00	0.3	-	1.4	-	1.24	-	17.5	-	789	1.80	14.50	470	3.08	3.69	0.110	0.47	45	38	39
3Cx10	6	1.00	0.3	-	1.4	-	1.40	-	19.5	-	1017	1.80	15.60	629	1.83	2.19	0.100	0.56	60	50	57
3Cx16	6	1.00	0.3	4x0.8	1.6	1.40	1.40	18.6	20.2	859	1057	1.80	18.40	705	1.15	1.38	0.097	0.76	77	64	66
3Cx25	6	1.20	0.3	4x0.8	1.6	1.40	1.40	21.3	22.9	1210	1431	2.00	21.50	1046	0.727	0.87	0.097	0.86	99	81	90
3Cx35	6	1.20	0.3	4x0.8	1.6	1.40	1.40	23.1	24.7	1532	1773	2.00	23.30	1350	0.524	0.627	0.097	0.98	120	99	110
3Cx50	6	1.40	0.3	4x0.8	1.6	1.56	1.56	26.6	28.2	2016	2305	2.00	26.50	1783	0.387	0.463	0.094	0.02	145	125	135
3Cx70	12	1.40	0.4	4x0.8	2.0	1.56	1.56	29.6	32.0	2684	3173	2.20	29.90	2446	0.268	0.321	0.090	1.18	175	150	165
3Cx95	15	1.60	0.4	4x0.8	2.0	1.56	1.72	33.5	36.2	3564	4169	2.20	33.80	3286	0.193	0.231	0.090	1.20	210	175	200
3Cx120	18	1.60	0.4	4x0.8	2.0	1.72	1.72	37.0	39.4	4371	5001	2.20	37.00	4034	0.153	0.184	0.087	1.31	240	195	230
3Cx150	18	1.80	0.5	4x0.8	2.0	1.88	1.88	40.1	42.4	5309	5974	2.40	40.10	4954	0.124	0.149	0.087	1.31	270	225	265
3Cx185	30	2.00	0.5	4x0.8	2.5	1.88	2.04	44.2	47.9	6502	7648	2.60	44.60	6145	0.0991	0.120	0.087	1.31	300	255	305
3Cx240	34	2.2	0.6	4x0.8	2.5	2.20	2.20	51.3	53.7	8422	9648	2.80	50.70	8018	0.0754	0.0912	0.087	1.34	345	295	355
3Cx300	34	2.4	0.6	4x0.8	2.5	2.36	2.36	55.0	58.4	10356	11710	3.00	55.50	9920	0.0601	0.0739	0.086	1.41	385	335	400
3Cx400	53	2.6	0.7	4x0.8	3.15	2.52	2.68	62.6	67.6	13107	15315	3.40	63.80	12717	0.047	0.0592	0.086	1.45	425	360	455



## 3.5 CORE ALUMINIUM PVC ARMoured POWER CABLES (AYWY/AYFY)

No. of core & cross sectional area	Min. No. of Wires	Thickness of PVC insulation (Nom.) mm	Min Thickness of Inner Sheath mm	ARMOUR		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS				
				Nominal Dimensions of Armour		Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm					Strip (Kg.Km)	Wire (Kg.Km)	Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip mm	Wire mm															
3.5Cx25/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	23.8	25.4	882	1128	1.2000	1.44	0.097	0.86	76	63	70		
3.5Cx35/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	24.8	26.4	1000	1263	0.8680	1.04	0.097	0.98	92	77	86		
3.5Cx50/25	6/6	1.4/1.2	0.3	4x0.8	1.60	1.56	1.56	28.4	30.0	1289	1583	0.6410	0.77	0.094	1.02	100	95	105		
3.5Cx70/35	12/6	1.4/1.2	0.4	4x0.8	2.00	1.56	1.56	32.5	34.9	1640	2184	0.4430	0.53	0.090	1.18	135	115	130		
3.5Cx95/50	15/6	1.6/1.4	0.4	4x0.8	2.00	1.56	1.72	36.2	38.9	2075	2716	0.3200	0.38	0.090	1.20	165	140	155		
3.5Cx120/70	15/12	1.6/1.4	0.5	4x0.8	2.00	1.72	1.88	39.3	42.1	2502	3203	0.2530	0.30	0.087	1.31	185	155	180		
3.5Cx150/70	15/12	1.8/1.4	0.5	4x0.8	2.00	1.88	1.88	44.0	46.4	2950	3680	0.2060	0.25	0.087	1.31	210	175	205		
3.5Cx185/95	30/15	2.0/1.6	0.5	4x0.8	2.50	2.04	2.04	49.8	52.2	3610	4813	0.1640	0.20	0.087	1.31	235	200	240		
3.5Cx240/120	30/15	2.2/1.6	0.6	4x0.8	2.50	2.20	2.36	55.2	58.9	4526	5715	0.1250	0.15	0.087	1.34	275	235	280		
3.5Cx300/150	30/15	2.4/1.8	0.6	4x0.8	3.15	2.36	2.52	59.7	64.7	5400	7531	0.1000	0.12	0.086	1.41	305	260	315		
3.5Cx400/185	53/30	2.6/2.0	0.7	4x0.8	3.15	2.68	2.68	68.6	73.3	6827	9211	0.0778	0.09	0.086	1.45	335	290	375		

## 3.5 CORE ALUMINIUM PVC UNARMoured POWER CABLES (AYY)

No. of core & cross sectional area	Min. No. of Wires	Thickness of PVC insulation (Nom.) mm	Min. Thickness of PVC Inner Sheath mm	Nom. Thickness of PVC Outer Sheath mm	Overall Diameter (Approx.) mm	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS		
											Direct in Ground Amps	In Duct in Amps	In Air Amps
3.5Cx25/16	6/6	1.2/1.0	0.30	2.00	24.00	692	1.20	1.44	0.097	0.86	76	63	70
3.5Cx35/16	6/6	1.2/1.0	0.30	2.00	25.00	799	0.868	1.04	0.097	0.98	92	77	86
3.5Cx50/25	6/6	1.4/1.2	0.30	2.00	28.30	1034	0.641	0.77	0.094	1.02	110	95	105
3.5Cx70/35	12/6	1.4/1.2	0.40	2.20	32.80	1373	0.443	0.53	0.090	1.18	135	115	130
3.5Cx95/50	15/6	1.6/1.4	0.40	2.20	36.50	1771	0.320	0.38	0.090	1.20	165	140	155
3.5Cx120/70	15/12	1.6/1.4	0.50	2.40	39.70	2180	0.253	0.30	0.087	1.31	185	155	180
3.5Cx150/70	15/12	1.8/1.4	0.50	2.40	44.00	2554	0.206	0.25	0.087	1.31	210	175	205
3.5Cx185/95	30/15	2.0/1.6	0.50	2.60	48.90	3176	0.164	0.20	0.087	1.31	235	200	240
3.5Cx240/120	30/15	2.2/1.6	0.60	3.00	56.00	4128	0.125	0.15	0.087	1.34	275	235	280
3.5Cx300/150	30/15	2.4/1.8	0.60	3.20	60.60	4989	0.100	0.12	0.086	1.41	305	260	315
3.5Cx400/185	53/30	2.6/2.0	0.70	3.40	69.40	6344	0.0778	0.09	0.086	1.45	335	290	375



WIRE & CABLES

**TORTEK**



## 3.5 CORE COPPER PVC ARMoured POWER CABLES (YWY/YFY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMOUR Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/Km	Approx Capacitance mfd/km	CURRENT RATINGS		
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg.Km)	Wire (Kg.Km)					Direct in Ground Amps	In Duct Amps	In Air Amps
3.5Cx25/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	23.8	25.4	1438	1685	0.727	0.87	0.097	0.86	99	81	90
3.5Cx35/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	24.8	26.4	1741	2004	0.524	0.627	0.097	0.98	120	99	110
3.5Cx50/25	6/6	1.4/1.2	0.3	4x0.8	1.60	1.56	1.56	28.4	30.0	2313	2606	0.387	0.463	0.094	1.02	145	125	135
3.5Cx70/35	12/6	1.4/1.2	0.4	4x0.8	2.00	1.56	1.56	32.5	34.9	3113	3657	0.268	0.321	0.090	1.18	175	150	165
3.5Cx95/50	15/6	1.6/1.4	0.4	4x0.8	2.00	1.56	1.72	36.2	38.9	4115	4756	0.193	0.231	0.090	1.20	210	175	200
3.5Cx120/70	18/12	1.6/1.4	0.5	4x0.8	2.00	1.72	1.88	39.3	42.1	5125	5827	0.153	0.184	0.087	1.31	240	195	230
3.5Cx150/70	18/12	1.8/1.4	0.5	4x0.8	2.00	1.88	1.88	44.0	46.4	6095	6825	0.124	0.149	0.087	1.31	270	225	265
3.5Cx185/95	30/15	2.0/1.6	0.5	4x0.8	2.50	2.04	2.04	48.8	52.2	7595	8799	0.0991	0.120	0.087	1.31	300	255	305
3.5Cx240/120	34/15	2.2/1.6	0.6	4x0.8	2.50	2.20	2.36	55.2	58.9	9738	11128	0.0754	0.0912	0.087	1.34	345	295	355
3.5Cx300/150	34/15	2.4/1.8	0.6	4x0.8	3.15	2.36	2.52	59.7	64.7	11945	14064	0.0601	0.0739	0.086	1.41	385	335	400
3.5Cx400/185	53/30	2.6/2.0	0.7	4x0.8	3.15	2.68	2.68	68.6	73.3	15139	17523	0.0470	0.0592	0.086	1.45	425	360	455

## 3.5 CORE COPPER PVC UNARMoured POWER CABLES (YY)

No. of core & cross sectional area	Min. No. of Wires	Thickness of PVC insulation (Nom.) mm	Min. Thick-ness of PVC Inner Sheath mm	Nom. Thick-ness of PVC Outer Sheath mm	Overall Diameter (Approx.) mm	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS		
											Direct in Ground Amps	In Duct in Amps	In Air Amps
3.5Cx25/16	6/6	1.2/1.0	0.30	2.00	24.00	1248	0.727	0.87	0.097	0.86	99	81	90
3.5Cx35/16	6/6	1.2/1.0	0.30	2.00	25.00	1541	0.524	0.627	0.097	0.98	120	99	110
3.5Cx50/25	6/6	1.4/1.2	0.30	2.00	28.30	2058	0.387	0.463	0.094	1.02	145	125	135
3.5Cx70/35	12/6	1.4/1.2	0.40	2.20	32.80	2845	0.268	0.321	0.090	1.18	175	150	165
3.5Cx95/50	15/6	1.6/1.4	0.40	2.20	36.50	3810	0.193	0.231	0.090	1.20	210	175	200
3.5Cx120/70	18/12	1.6/1.4	0.50	2.40	39.70	4804	0.153	0.184	0.087	1.31	240	195	230
3.5Cx150/70	18/12	1.8/1.4	0.50	2.40	44.00	5699	0.124	0.149	0.087	1.31	270	225	265
3.5Cx185/95	30/15	2.0/1.6	0.50	2.60	48.90	7161	0.099	0.1200	0.087	1.31	300	255	305
3.5Cx240/120	34/15	2.2/1.6	0.60	3.00	56.00	9340	0.075	0.0912	0.087	1.34	345	295	355
3.5Cx300/150	34/15	2.4/1.8	0.60	3.20	60.60	11521	0.060	0.0739	0.086	1.41	385	335	400
3.5Cx400/185	53/30	2.6/2.0	0.70	3.40	69.40	14651	0.0470	0.0592	0.086	1.45	425	360	455

## 4 CORE ALUMINIUM PVC ARMoured & UNARMoured POWER CABLES (AYWY/AYFY/AYY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insulation (Nom.) mm	Min Thick-ness of PVC Inner-Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 70°C Ohms/Km	Approx Reactance at 50 Hz Ohms/Km	Approx Capacitance mfd/km	CURRENT RATINGS		
				Nominal Jimen- sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Ne Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap- prox) mm	Net Wt. of Cable (Ap- prox) Kg/Km					Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg/ Km)	Wire (Kg/ Km)										
4Cx1.5	---	0.8	0.3	-	1.40	-	1.24	-	14.5	-	470	1.80	11.70	210	18.10	21.72	0.126	0.140	16	14	13
4Cx2.5	---	0.9	0.3	-	1.40	-	1.24	-	16.0	-	560	1.80	13.20	270	12.10	14.52	0.119	0.150	21	18	18
4Cx4	---	1.0	0.3	-	1.40	-	1.24	-	17.5	-	675	1.80	15.00	340	7.41	8.89	0.116	0.410	28	23	23
4Cx6	---	1.0	0.3	-	1.40	-	1.24	-	19.0	-	800	1.80	16.00	420	4.61	5.53	0.110	0.470	35	30	30
4Cx10	---	1.0	0.3	4x0.8	1.60	1.40	1.40	21.5	23.0	800	1030	1.80	19.00	510	3.08	3.70	0.100	0.560	46	39	40
4Cx16	6	1.0	0.3	4x0.8	1.60	1.40	1.40	22.2	23.8	727	966	2.00	22.40	553	1.91	2.29	0.097	0.760	60	50	51
4Cx25	6	1.2	0.3	4x0.8	1.60	1.40	1.40	23.6	25.2	915	1165	2.00	23.80	728	1.20	1.44	0.097	0.860	76	63	70
4Cx35	6	1.2	0.3	4x0.8	1.60	1.40	1.56	25.9	27.8	1097	1396	2.00	26.10	886	0.868	1.04	0.097	0.980	92	77	86
4Cx50	6	1.4	0.4	4x0.8	2.00	1.56	1.56	30.3	32.7	1432	1935	2.20	30.60	1187	0.641	0.77	0.094	1.020	110	95	105
4Cx70	12	1.4	0.4	4x0.8	2.00	1.56	1.56	33.4	35.8	1781	2336	2.20	33.70	1505	0.443	0.53	0.090	1.180	135	115	130
4Cx95	15	1.6	0.4	4x0.8	2.00	1.72	1.72	38.2	40.6	2311	2948	2.40	38.60	1997	0.320	0.38	0.090	1.200	165	140	155
4Cx120	15	1.6	0.5	4x0.8	2.00	1.88	1.88	41.7	44.1	2762	3453	2.40	41.70	2390	0.253	0.30	0.087	1.310	185	155	180
4Cx150	15	1.8	0.5	4x0.8	2.50	1.88	2.04	44.7	48.4	3246	4387	2.60	45.10	2885	0.206	0.25	0.087	1.310	210	175	205
4Cx185	30	2.0	0.6	4x0.8	2.50	2.04	2.20	50.1	53.8	3982	5245	2.80	50.80	3615	0.164	0.20	0.087	1.310	235	200	240
4Cx240	30	2.2	0.6	4x0.8	2.50	2.36	2.36	56.7	60.1	5038	6445	3.00	57.20	4587	0.125	0.15	0.087	1.340	275	235	280
4Cx300	30	2.4	0.7	4x0.8	3.15	2.52	2.68	62.9	68.0	6109	8376	3.40	64.10	5716	0.100	0.12	0.086	1.410	305	360	315
4Cx400	53	2.6	0.7	4x0.8	3.15	2.84	2.84	70.6	75.3	7640	10124	3.60	71.50	7157	0.0778	0.09	0.086	1.450	335	290	375



WIRE & CABLES

**TORTEK**

# 4 CORE COPPER PVC ARMoured & UNARMoured POWER CABLES (YWy/YFY/YY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of PVC insulation (Nom.) mm	Min Thick-ness of PVC Inner-Sheath mm	ARMoured								UNARMoured			Max. D.C. Re-sistance at 20°C Ohms/ Km	Max. A.C. Resis-tance at 70°C Ohms/ Km	Approx Reac-tance at 50 Hz Ohms/ Km	Approx Capac-i-tance mfd/km	CURRENT RATINGS		
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Duct in Amps	In Air Amps
				Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip (Kg/Km)	Wire (Kg/Km)										
4Cx1.5	---	0.8	0.3	-	1.40	-	1.24	-	14.5	-	503	1.80	11.70	256	12.1	14.5	0.126	0.14	21	17	17
4Cx2.5	---	0.9	0.3	-	1.40	-	1.24	-	16.0	-	616	1.80	13.20	335	7.41	8.87	0.119	0.15	27	24	24
4Cx4	---	1.0	0.3	-	1.40	-	1.24	-	17.5	-	771	1.80	15.00	446	4.61	5.52	0.116	0.41	36	30	30
4Cx6	---	1.0	0.3	-	1.40	-	1.24	-	19.0	-	947	1.80	16.00	576	3.08	3.69	0.110	0.47	45	39	38
4Cx10	---	1.0	0.3	4x0.8	1.60	1.40	1.40	21.5	23.0	1045	1273	1.80	19.00	773	1.83	2.19	0.100	0.56	60	57	50
4Cx16	6	1.0	0.3	4x0.8	1.60	1.40	1.40	22.2	23.8	1113	1352	2.00	22.40	940	1.15	1.38	0.097	0.76	77	66	64
4Cx25	6	1.2	0.3	4x0.8	1.60	1.40	1.40	23.6	25.2	1529	1779	2.00	23.80	1342	0.727	0.87	0.097	0.86	99	90	81
4Cx35	6	1.2	0.3	4x0.8	1.60	1.40	1.56	25.9	27.8	1955	2254	2.00	26.10	1744	0.524	0.62	0.097	0.98	120	110	99
4Cx50	6	1.4	0.4	4x0.8	2.00	1.56	1.56	30.3	32.7	2593	3096	2.20	30.60	2347	0.387	0.46	0.094	1.02	145	135	125
4Cx70	12	1.4	0.4	4x0.8	2.00	1.56	1.56	33.4	35.8	3459	4015	2.20	33.70	3183	0.268	0.32	0.090	1.18	175	165	150
4Cx95	15	1.6	0.4	4x0.8	2.00	1.72	1.72	38.2	40.6	4643	5280	2.40	38.60	4330	0.193	0.23	0.090	1.20	210	200	175
4Cx120	15	1.6	0.5	4x0.8	2.00	1.88	1.88	41.7	44.1	5702	6393	2.40	41.70	5330	0.153	0.18	0.087	1.31	240	230	195
4Cx150	15	1.8	0.5	4x0.8	2.50	1.88	2.04	44.7	48.4	6872	8012	2.60	45.10	6511	0.124	0.14	0.087	1.31	270	265	225
4Cx185	30	2.0	0.6	4x0.8	2.50	2.04	2.20	50.1	53.8	8519	9782	2.80	50.80	8152	0.0991	0.12	0.087	1.31	300	305	255
4Cx240	30	2.2	0.6	4x0.8	2.50	2.36	2.36	56.7	60.1	11008	12415	3.00	57.20	10557	0.0754	0.091	0.087	1.34	345	355	295
4Cx300	30	2.4	0.7	4x0.8	3.15	2.52	2.68	62.9	68.0	13610	15877	3.40	64.10	13218	0.0601	0.073	0.086	1.41	385	400	335
4Cx400	53	2.6	0.7	4x0.8	3.15	2.84	2.84	70.6	75.3	17213	19697	3.60	71.50	16729	0.0470	0.059	0.086	1.45	425	455	360





## CURRENT RATING (XLPE)

### Basic assumption and conditions of installation

Max. Conductor temperature at continuous operation	90°C
Ambient Air temperature	40°C
Ground temperature	30°C
Thermal Resistivity of soil	150°C Cm/W
Depth of laying	750°C
Max. Conductor temperature for short circuit	250°C

### Rating Factors for Variation in Ground Temperature

Ground temperature °C	15	20	25	30	35	40
Rating factor	1.12	1.08	1.03	1.00	0.96	0.91

### Rating Factors for Variation in Ambient Air Temperature

Ambient Air temperature °C	25	30	35	40	45	50
Rating factor	1.14	1.10	1.04	1.00	0.95	0.90

### Rating factors cables laid directly laid in ground in horizontal formation

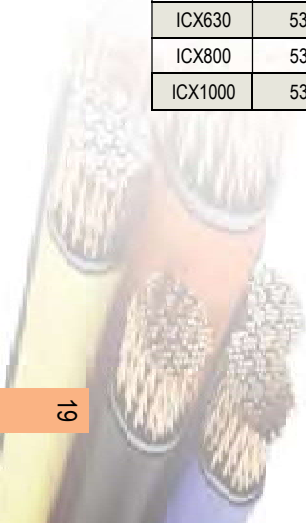
No. of cables	Distance of Cables			
	Touching	15 cm	30 cm	45 cm
2 Cables	0.79	0.82	0.87	0.90
3 Cables	0.69	0.75	0.79	0.83
4 Cables	0.62	0.69	0.74	0.79
5 Cables	0.58	0.65	0.72	0.76
6 Cables	0.54	0.61	0.69	0.75

### Rating factors for variation in depth of laying in ground

Depth of laying	Size		
	Upto 25 mm <sup>2</sup>	25 to 300 mm <sup>2</sup>	Above 300 mm <sup>2</sup>
75 cm	1.00	1.00	1.00
90 cm	0.99	0.98	0.97
105 cm	0.98	0.97	0.96
120 cm	0.97	0.96	0.95
150 cm	0.96	0.94	0.92
180 cm >	0.95	0.93	0.91

# 1 CORE ALUMINIUM XLPE ARMoured & UNARMoured POWER CABLES (A2XWY/A2XFY/A2XY)

No. of cores & cross sectional area	Min. No. of Wires	ARMoured					UNARMoured					Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	ARMoured		UNARMoured		CURRENT RATINGS	
		Thick-ness of XLPE in-sulation (Nom.) (mm)	Nominal Dimen-sions of Armour Wire (mm)	Min. Thick-ness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Thick-ness of XLPE in-sulation (Nom) (mm)	Nominal Dimen-sions of Armour Wire (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Approx. Reac-tance at 50 Hz Ohms/Km			Approx. Capacitance mfd/Km	Approx. Reac-tance at 50 Hz Ohms/Km	Approx. Capacitance mfd/Km	Direct in Ground Amps	In Air Amps	
ICX4	1	-	-	-	-	-	0.7	1.8	7.5	60	7.41	9.48	-	-	0.132	0.29	36	31	
ICX4	6	-	-	-	-	-	0.7	1.8	8.0	65	7.41	9.48	-	-	0.132	0.29	36	31	
ICX6	1	-	-	-	-	-	0.7	1.8	8.0	70	4.61	5.90	-	-	0.123	0.34	44	39	
ICX6	6	-	-	-	-	-	0.7	1.8	8.5	75	4.61	5.90	-	-	0.123	0.34	44	39	
ICX10	1	1.0	-	-	-	-	0.7	1.8	9.0	80	3.08	3.94	0.134	0.32	0.114	0.43	59	53	
ICX10	6	1.0	1.40	1.24	12.0	-	0.7	1.8	9.5	90	3.08	3.94	0.134	0.32	0.114	0.43	59	53	
ICX16	6	1.0	1.40	1.24	13.0	220	0.7	1.8	10.0	115	1.91	2.44	0.125	0.38	0.108	0.51	76	73	
ICX25	6	1.20	1.40	1.24	14.1	253	0.90	1.80	11.8	177	1.200	1.5400	0.116	0.40	0.102	0.52	97	99	
ICX35	6	1.20	1.40	1.24	15.1	297	0.90	1.80	12.8	215	0.868	1.1100	0.110	0.47	0.097	0.60	116	112	
ICX50	6	1.30	1.40	1.24	16.4	358	1.00	1.80	14.1	270	0.641	0.8200	0.103	0.50	0.092	0.63	139	149	
ICX70	12	1.40	1.40	1.24	18.2	448	1.10	1.80	15.9	347	0.443	0.5670	0.099	0.55	0.088	0.68	171	190	
ICX95	15	1.40	1.60	1.40	20.6	588	1.10	1.80	17.6	438	0.320	0.4100	0.097	0.64	0.085	0.79	204	235	
ICX120	15	1.50	1.60	1.40	22.9	701	1.20	1.80	20.3	556	0.253	0.3250	0.093	0.67	0.082	0.79	231	276	
ICX150	15	1.70	1.60	1.40	24.0	806	1.40	2.00	21.4	652	0.206	0.2650	0.091	0.67	0.082	0.79	259	321	
ICX185	30	1.90	1.60	1.40	26.3	966	1.60	2.00	23.7	795	0.164	0.2110	0.090	0.67	0.082	0.79	292	371	
ICX240	30	2.00	1.60	1.40	28.9	1179	1.70	2.00	26.3	991	0.125	0.1620	0.086	0.72	0.079	0.84	342	447	
ICX300	30	2.10	1.60	1.56	31.5	1421	1.80	2.00	28.6	1193	0.100	0.1300	0.085	0.75	0.078	0.86	384	515	
ICX400	53	2.40	2.00	1.56	35.9	1836	2.00	2.20	32.4	1519	0.0778	0.1023	0.085	0.75	0.077	0.88	440	606	
ICX500	53	2.60	2.00	1.56	39.3	2232	2.20	2.20	35.8	1887	0.0605	0.0808	0.083	0.77	0.076	0.90	500	705	
ICX630	53	2.80	2.00	1.72	43.6	2773	2.40	2.20	39.8	2360	0.0469	0.0648	0.082	0.81	0.075	0.94	565	823	
ICX800	53	3.10	2.00	1.88	50.0	3730	2.60	2.40	46.0	3100	0.0362	0.0530	0.081	0.88	0.075	0.97	629	949	
ICX1000	53	3.30	2.50	2.04	55.9	4411	2.80	2.60	51.0	3735	0.0291	0.0444	0.081	0.88	0.068	1.01	704	1076	



# 1 CORE COPPER XLPE ARMoured & UNARMoured POWER CABLES (2XWY/2XFY/2XY)

No. of cores & cross sectional area	Min. No. of Wires	ARMoured					UNARMoured					Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/ Km	ARMoured		UNARMoured		CURRENT RATINGS	
		Thick-ness of XLPE in-sulation (Nom.) (mm)	Nominal Dimen-sions of Armour Wire (mm)	Min. Thick-ness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Thick-ness of XLPE in-sulation (Nom) (mm)	Nominal Dimen-sions of Armour Wire (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Approx. Reac-tance at 50 Hz Ohms/ Km			Approx. Capacitance mfd/Km	Approx. Reac-tance at 50 Hz Ohms/ Km	Approx. Capacitance mfd/Km	Direct in Ground Amps	In Air Amps	
ICX4	1	-	-	-	-	-	0.7	1.8	7.5	91	4.61	5.90	-	-	0.132	0.29	46	40	
ICX4	6	-	-	-	-	-	0.7	1.8	8.0	95	4.61	5.90	-	-	0.132	0.29	46	40	
ICX6	1	-	-	-	-	-	0.7	1.8	8.0	115	3.08	3.94	-	-	0.123	0.34	57	51	
ICX6	6	-	-	-	-	-	0.7	1.8	8.5	125	3.08	3.94	-	-	0.123	0.34	57	51	
ICX10	6	1.0	1.40	1.24	12.0	245	0.7	1.8	9.5	170	1.83	2.34	0.134	0.32	0.114	0.43	76	71	
ICX16	6	1.0	1.40	1.24	13.0	315	0.7	1.8	10.0	220	1.15	1.47	0.125	0.38	0.108	0.51	97	95	
ICX25	6	1.20	1.40	1.24	14.1	407	0.90	1.8	11.8	331	0.727	0.930	0.116	0.40	0.102	0.52	125	126	
ICX35	6	1.20	1.40	1.24	15.1	511	0.90	1.8	12.8	428	0.524	0.671	0.110	0.47	0.097	0.60	153	158	
ICX50	6	1.30	1.40	1.24	16.4	643	1.00	1.8	14.1	554	0.387	0.495	0.103	0.50	0.092	0.63	181	194	
ICX70	12	1.40	1.40	1.24	18.2	866	1.10	1.8	15.9	764	0.268	0.343	0.099	0.55	0.088	0.68	217	249	
ICX95	15	1.40	1.60	1.40	20.6	1168	1.10	1.8	17.6	1018	0.193	0.247	0.097	0.67	0.085	0.79	264	307	
ICX120	18	1.50	1.60	1.40	22.9	1432	1.20	1.8	20.3	1287	0.153	0.196	0.093	0.67	0.082	0.79	296	357	
ICX150	18	1.70	1.60	1.40	24.0	1710	1.40	2.0	21.4	1556	0.124	0.159	0.091	0.67	0.082	0.79	333	411	
ICX185	30	1.90	1.60	1.40	26.3	2095	1.60	2.0	23.7	1924	0.0991	0.127	0.090	0.67	0.082	0.79	375	479	
ICX240	34	2.00	1.60	1.40	28.9	2664	1.70	2.0	26.3	2476	0.0754	0.0965	0.086	0.72	0.079	0.84	434	569	
ICX300	34	2.10	1.60	1.56	31.5	3287	1.80	2.0	28.6	3058	0.060	0.0769	0.085	0.75	0.078	0.86	490	659	
ICX400	53	2.40	2.00	1.56	35.9	4217	2.00	2.2	32.4	3899	0.0470	0.0608	0.085	0.75	0.077	0.88	556	769	
ICX500	53	2.60	2.00	1.56	39.3	5286	2.20	2.2	35.8	4941	0.0366	0.0468	0.083	0.77	0.076	0.90	620	877	
ICX630	53	2.80	2.00	1.72	43.6	6728	2.40	2.2	39.8	6315	0.0283	0.0362	0.082	0.81	0.075	0.94	695	1013	
ICX800	53	3.10	2.00	1.88	50.0	8250	2.60	2.4	46.0	7676	0.0221	0.0283	0.081	0.88	0.075	0.97	758	1148	
ICX1000	53	3.30	2.50	2.04	55.9	10766	2.80	2.6	51.0	10090	0.0176	0.0225	0.081	0.88	0.068	1.01	834	1275	



WIRE & CABLES

**TORTEK**

## 2 CORE ALUMINIUM XLPE ARMoured POWER CABLES (A2XWY/A2XFY/A2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner-Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Ca-pacitance mfd/km	CURRENT RATINGS	
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Ne Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diameter (Approx) mm	Net Wt. of Cable (Approx) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
2Cx4	1	0.7	0.3	1.40	-	1.24	-	14.9	-	434	-	1.8	13.2	204	7.410	9.480	0.0927	0.22	43	39
2Cx4	6	0.7	0.3	1.40	-	1.24	-	15.5	-	455	-	1.8	13.8	219	7.410	9.480	0.0927	0.22	43	39
2Cx6	1	0.7	0.3	1.40	-	1.24	-	16.0	-	486	-	1.8	14.2	239	4.610	5.900	0.0884	0.25	55	50
2Cx6	6	0.7	0.3	1.40	-	1.24	-	16.6	-	510	-	1.8	14.8	255	4.610	5.900	0.0884	0.25	55	50
2Cx10	1	0.7	0.3	1.40	-	1.24	-	17.7	-	585	-	1.8	15.8	303	3.080	3.940	0.0837	0.31	71	67
2Cx10	6	0.7	0.3	1.40	-	1.24	-	18.5	-	626	-	1.8	16.8	331	3.080	3.940	0.0837	0.31	71	67
2Cx16	6	0.7	0.3	1.40	-	1.40	-	18.8	-	673	-	1.8	14.0	225	1.910	2.440	0.0808	0.36	91	88
2Cx25	6	0.90	0.3	1.60	4x0.8	1.40	1.40	21.2	19.6	797	582	2.0	19.2	400	1.200	1.540	0.080	0.20	120	117
2Cx35	6	0.90	0.3	1.60	4x0.8	1.40	1.40	22.2	20.6	880	664	2.0	20.2	469	0.868	1.110	0.080	0.23	143	145
2Cx50	6	1.00	0.3	1.60	4x0.8	1.40	1.40	24.3	22.7	1056	808	2.0	22.3	588	0.641	0.820	0.078	0.24	167	176
2Cx70	12	1.10	0.3	1.60	4x0.8	1.56	1.56	27.1	25.5	1287	1013	2.0	24.8	743	0.443	0.567	0.077	0.26	204	221
2Cx95	15	1.10	0.4	2.00	4x0.8	1.56	1.56	30.8	28.4	1738	1255	2.2	28.1	974	0.320	0.410	0.074	0.29	245	271
2Cx120	15	1.20	0.4	2.00	4x0.8	1.56	1.56	32.7	30.3	1967	1464	2.2	30.0	1159	0.253	0.325	0.072	0.29	278	316
2Cx150	15	1.40	0.4	2.00	4x0.8	1.72	1.72	36.2	33.8	2334	1754	2.2	33.2	1386	0.206	0.265	0.072	0.29	315	362
2Cx185	30	1.60	0.5	2.00	4x0.8	1.88	1.72	39.9	37.1	2763	2105	2.4	36.9	1728	0.164	0.211	0.072	0.29	356	420
2Cx240	30	1.70	0.5	2.50	4x0.8	2.04	1.88	43.9	40.2	3568	2556	2.6	40.0	2155	0.125	0.162	0.072	0.31	407	497
2Cx300	30	1.80	0.6	2.50	4x0.8	2.20	2.04	49.5	45.8	4273	3102	2.8	45.7	2649	0.100	0.130	0.071	0.33	463	578
2Cx400	53	2.00	0.6	2.50	4x0.8	2.36	2.36	54.0	50.0	5600	4230	3.0	49.0	3530	0.0778	0.1023	0.071	0.33	528	678



## 2 CORE COPPER XLPE ARMoured POWER CABLES (2XWY/2XFY/2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS	
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diam-eter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diameter (Approx) mm	Net Wt. of Cable (Approx) Kg/Km					Direct in round Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
2Cx4	1	0.7	0.3	1.40	-	1.24	-	14.9	-	531	-	1.8	13.2	254	4.61	5.9000	0.0927	0.22	56	51
2Cx4	6	0.7	0.3	1.40	-	1.24	-	15.5	-	555	-	1.8	13.8	268	4.61	5.9000	0.0927	0.22	56	51
2Cx6	1	0.7	0.3	1.40	-	1.24	-	16.0	-	614	-	1.8	14.2	314	3.08	3.9400	0.0884	0.25	71	64
2Cx6	6	0.7	0.3	1.40	-	1.24	-	16.6	-	639	-	1.8	14.8	328	3.08	3.9400	0.0884	0.25	71	64
2Cx10	6	0.7	0.3	1.40	-	1.24	-	18.5	-	817	-	1.8	16.8	455	1.83	2.3400	0.0837	0.31	92	88
2Cx16	6	0.7	0.3	1.40	-	1.40	-	18.8	-	866	-	1.8	14.0	425	1.150	1.4700	0.0808	0.36	116	113
2Cx25	6	0.90	0.3	1.60	4x0.8	1.40	1.40	21.2	19.6	1103	889	2.0	19.2	706	0.727	0.9300	0.0800	0.20	152	153
2Cx35	6	0.90	0.3	1.60	4x0.8	1.40	1.40	22.2	20.6	1309	1093	2.0	20.2	898	0.524	0.6710	0.0800	0.23	180	186
2Cx50	6	1.00	0.3	1.60	4x0.8	1.40	1.40	24.3	22.7	1626	1379	2.0	23.3	1158	0.387	0.4950	0.0780	0.24	218	226
2Cx70	12	1.10	0.3	1.60	4x0.8	1.56	1.56	27.1	25.5	2126	1852	2.0	24.8	1582	0.268	0.3430	0.0770	0.26	264	284
2Cx95	15	1.10	0.4	2.00	4x0.8	1.56	1.56	30.8	28.4	2904	2422	2.2	28.1	2140	0.193	0.2470	0.0740	0.29	314	384
2Cx120	18	1.20	0.4	2.00	4x0.8	1.56	1.56	32.7	30.3	3436	2933	2.2	30.0	2628	0.153	0.1960	0.0720	0.29	357	402
2Cx150	18	1.40	0.4	2.00	4x0.8	1.72	1.72	36.2	33.8	4150	3571	2.2	33.2	3202	0.124	0.1590	0.0720	0.29	403	461
2Cx185	30	1.60	0.5	2.00	4x0.8	1.88	1.72	39.9	37.1	5032	4373	2.4	36.9	3997	0.0991	0.1270	0.0720	0.29	453	533
2Cx240	34	1.70	0.5	2.50	4x0.8	2.04	1.88	43.9	40.2	6553	5541	2.6	40.0	5140	0.0754	0.0965	0.0720	0.31	518	633
2Cx300	34	1.80	0.6	2.50	4x0.8	2.20	2.04	49.5	45.8	8024	6845	2.8	45.7	6400	0.0601	0.0769	0.0710	0.33	583	732
2Cx400	53	2.00	0.6	2.50	4x0.8	2.36	2.36	54.0	50.0	9688	8437	3.0	49.0	7732	0.0470	0.0602	0.0700	0.33	658	841



**WIRE & CABLES**

**TORTEK**



## 3 CORE ALUMINIUM XLPE ARMoured POWER CABLES (A2XWY/A2XFY/A2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insula-tion (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS	
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire Kg.Km	Strip Kg.Km									
3Cx4	1	0.7	0.3	1.4	-	1.24	-	15.5	-	487	-	1.8	13.8	224	7.41	9.48	0.0927	0.22	34	31
3Cx4	6	0.7	0.3	1.4	-	1.24	-	16.1	-	524	-	1.8	14.5	238	7.41	9.48	0.0927	0.22	34	31
3Cx6	1	0.7	0.3	1.4	-	1.24	-	16.6	-	561	-	1.8	14.9	265	4.61	5.90	0.0884	0.25	43	40
3Cx6	6	0.7	0.3	1.4	-	1.24	-	17.4	-	587	-	1.8	15.5	265	4.61	5.90	0.0884	0.25	43	40
3Cx10	1	0.7	0.3	1.4	-	1.24	-	18.5	-	686	-	1.8	16.6	340	3.08	3.94	0.0837	0.31	57	53
3Cx10	6	0.7	0.3	1.4	-	1.24	-	19.4	-	736	-	1.8	17.7	368	3.08	3.44	0.0837	0.31	57	53
3Cx16	6	0.7	0.3	1.6	4x0.8	1.40	1.24	19.7	17.8	822	530	1.8	17.9	361	1.91	1.11	0.0808	0.36	73	70
3Cx25	6	0.9	0.3	1.6	4x0.8	1.40	1.40	21.7	20.1	861	769	2.0	20.3	502	1.200	1.11	0.080	0.20	97	95
3Cx35	6	0.9	0.3	1.6	4x0.8	1.40	1.40	23.8	22.2	1028	918	2.0	22.4	616	0.868	1.54	0.080	0.23	116	117
3Cx50	6	1.0	0.3	1.6	4x0.8	1.56	1.40	26.5	24.6	1252	1111	2.0	25.0	782	0.641	1.11	0.078	0.24	134	140
3Cx70	12	1.1	0.4	2.0	4x0.8	1.56	1.56	31.3	28.9	1790	1472	2.2	29.2	1059	0.443	0.82	0.077	0.26	167	176
3Cx95	15	1.1	0.4	2.0	4x0.8	1.56	1.56	33.5	31.1	2091	1575	2.2	31.4	1322	0.320	0.41	0.074	0.29	199	221
3Cx120	15	1.2	0.4	2.0	4x0.8	1.72	1.56	38.4	35.7	2549	2153	2.2	36.0	1626	0.253	0.325	0.072	0.29	227	258
3Cx150	15	1.4	0.5	2.0	4x0.8	1.88	1.72	42.0	39.2	3020	2317	2.4	39.6	1997	0.206	0.265	0.072	0.29	255	294
3Cx185	30	1.6	0.5	2.5	4x0.8	2.04	1.88	47.0	43.3	3940	2808	2.6	43.7	2461	0.164	0.211	0.072	0.29	287	339
3Cx240	30	1.7	0.6	2.5	4x0.8	2.2	2.04	50.0	46.3	4616	3453	2.8	47.0	3118	0.125	0.162	0.072	0.31	333	402
3Cx300	30	1.8	0.6	2.5	4x0.8	2.36	2.2	55.3	51.6	5495	4169	3.0	52.4	3801	0.100	0.130	0.071	0.33	375	461
3Cx400	53	2.0	0.7	3.15	4x0.8	2.68	2.52	63.5	58.4	8041	5267	3.2	59.2	4853	0.0778	0.1023	0.07	0.33	426	542



### 3 CORE COPPER XLPE ARMoured POWER CABLES (2XWY/2XFY/2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS	
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Approx) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
3Cx4	1	0.7	0.3	1.4	-	1.24	-	15.5	-	561	-	1.8	13.8	298	4.6100	5.9000	0.0927	0.22	44	40
3Cx4	6	0.7	0.3	1.4	-	1.24	-	16.1	-	598	-	1.8	14.5	313	4.6100	5.9000	0.0927	0.22	44	40
3Cx6	1	0.7	0.3	1.4	-	1.24	-	16.6	-	673	-	1.8	14.9	376	3.0800	3.9400	0.0884	0.25	55	51
3Cx6	6	0.7	0.3	1.4	-	1.24	-	17.4	-	697	-	1.8	15.5	390	3.0800	3.9400	0.0884	0.25	55	51
3Cx10	6	0.7	0.3	1.4	-	1.24	-	19.8	-	922	-	1.8	17.7	554	1.8300	2.3400	0.0837	0.31	73	70
3Cx16	6	0.7	0.3	1.60	4x0.8	1.4	1.24	19.7	17.8	1112	885	1.8	17.9	639	1.1500	1.4700	0.0808	0.36	97	90
3Cx25	6	0.90	0.3	1.60	4x0.8	1.4	1.4	21.7	20.1	1450	1230	2.0	20.3	962	0.7270	0.9300	0.08	0.2	125	122
3Cx35	6	0.90	0.3	1.60	4x0.8	1.4	1.4	23.8	22.2	1803	1563	2.0	22.4	1260	0.5240	0.6710	0.08	0.23	148	148
3Cx50	6	1.00	0.3	1.60	4x0.8	1.56	1.4	26.5	24.6	2272	1980	2.0	25.0	1651	0.3870	0.4950	0.078	0.24	175	181
3Cx70	12	1.10	0.4	2.00	4x0.8	1.56	1.56	31.3	28.9	3266	2730	2.2	29.2	2317	0.2680	0.3430	0.077	0.26	213	230
3Cx95	15	1.10	0.4	2.00	4x0.8	1.56	1.56	33.5	31.4	4092	3521	2.2	31.4	3071	0.1960	0.2470	0.074	0.29	254	284
3Cx120	18	1.20	0.4	2.00	4x0.8	1.72	1.56	38.4	35.7	5033	4358	2.2	36.0	3831	0.1530	0.1930	0.072	0.29	292	330
3Cx150	18	1.40	0.5	2.00	4x0.8	1.88	1.72	42	39.2	6049	5263	2.4	39.6	4722	0.1240	0.1590	0.072	0.29	325	375
3Cx185	30	1.60	0.5	2.50	4x0.8	2.04	1.88	47	43.3	7713	6503	2.6	43.7	5863	0.0991	0.1270	0.072	0.29	366	434
3Cx240	34	1.70	0.6	2.50	4x0.8	2.2	2.04	50	46.3	9600	8287	2.8	47.0	7595	0.0754	0.0965	0.072	0.31	421	515
3Cx300	34	1.80	0.6	2.50	4x0.8	2.36	2.2	55.3	51.6	11628	10191	3.0	52.4	9426	0.0601	0.0769	0.071	0.33	472	588
3Cx400	53	2.00	0.7	3.15	4x0.8	2.68	2.52	63.5	58.4	15220	12950	3.2	59.2	12032	0.0470	0.0602	0.07	0.33	528	677



**WIRE & CABLES**

**TORTEK**

## 3.5 CORE ALUMINIUM XLPE ARMoured POWER CABLES (A2XWY/A2XFY/A2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/ Km	Approx Reactance at 50 Hz Ohms/ km	Approx Capac- itance mfd/km	CURRENT RATINGS	
				Nominal Dimen- sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap- prox) mm	Net Wt. of Cable (Ap- prox) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
3.5Cx25/16	6/6	0.9/0.7	0.3	1.60	4x0.8	1.40	1.40	23.8	22.2	999	760	2.0	22.4	587	1.2000	1.540	0.080	0.20	97	95
3.5Cx35/16	6/6	0.9/0.7	0.3	1.60	4x0.8	1.40	1.40	25.5	23.9	1146	885	2.0	24.1	694	0.8680	1.110	0.080	0.23	116	117
3.5Cx50/25	6/6	1.0/0.9	0.3	1.60	4x0.8	1.56	1.40	29.0	27.1	1427	1114	2.0	27.3	890	0.6410	0.820	0.078	0.24	134	140
3.5Cx70/35	12/6	1.1/0.9	0.4	2.00	4x0.8	1.56	1.56	34.0	31.6	2006	1473	2.2	31.9	1215	0.4430	0.567	0.077	0.26	167	176
3.5Cx95/50	15/6	1.1/1.0	0.4	2.00	4x0.8	1.56	1.56	37.6	35.2	2436	1834	2.2	35.5	1540	0.3200	0.410	0.074	0.29	199	221
3.5Cx120/70	15/12	1.2/1.1	0.4	2.00	4x0.8	1.72	1.72	40.2	37.8	2863	2220	2.2	37.8	1875	0.2530	0.325	0.072	0.29	227	258
3.5Cx150/70	15/12	1.4/1.1	0.5	2.00	4x0.8	1.88	1.72	45.2	42.4	3378	2623	2.4	42.8	2271	0.2060	0.265	0.072	0.29	255	294
3.5Cx185/95	30/15	1.6/1.1	0.5	2.50	4x0.8	2.04	1.88	49.7	46.0	4339	3179	2.6	46.4	2805	0.1640	0.211	0.072	0.29	287	339
3.5Cx240/120	30/15	1.7/1.2	0.6	2.50	4x0.8	2.20	2.04	55.4	51.7	5298	3981	2.8	52.4	3599	0.1250	0.162	0.072	0.31	333	402
3.5Cx300/150	30/15	1.8/1.4	0.6	2.50	4x0.8	2.36	2.20	59.3	55.6	6172	4750	3.0	56.4	4348	0.1000	0.130	0.071	0.33	375	461
3.5Cx400/185	53/30	2.0/1.6	0.7	3.15	4x0.8	2.68	2.52	69.2	64.1	8341	6030	3.4	65.3	5629	0.0778	0.1023	0.070	0.33	426	542



## 3.5 CORE COPPER XLPE ARMoured POWER CABLES (2XWY/2XFY/2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx React-ance at 50 Hz Ohms/km	Approx Capac-ity mfd/km	CURRENT RATINGS	
				Nominal Dimen-sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam-eter (Ap-prox) mm	Net Wt. of Cable (Ap-prox) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
3.5Cx25/16	6/6	0.9/0.7	0.3	1.60	4x0.8	1.40	1.40	23.8	22.2	1556	1316	2.0	22.4	1143	0.727	0.930	0.080	0.20	125	122
3.5Cx35/16	6/6	0.9/0.7	0.3	1.60	4x0.8	1.40	1.40	25.5	23.9	1887	1626	2.0	24.1	1436	0.524	0.671	0.080	0.23	148	148
3.5Cx50/25	6/6	1.0/0.9	0.3	1.60	4x0.8	1.56	1.40	29.0	27.1	2627	2137	2.0	27.3	1914	0.387	0.495	0.078	0.24	175	181
3.5Cx70/35	12/6	1.1/0.9	0.4	2.00	4x0.8	1.56	1.56	34.0	31.6	3479	2946	2.2	31.9	2688	0.268	0.343	0.077	0.26	213	230
3.5Cx95/50	15/6	1.1/1.0	0.4	2.00	4x0.8	1.56	1.56	37.6	35.2	4476	3874	2.2	35.5	3579	0.193	0.247	0.074	0.29	254	284
3.5Cx120/70	18/12	1.2/1.1	0.4	2.00	4x0.8	1.72	1.72	40.2	37.8	5487	4844	2.2	37.8	4498	0.153	0.196	0.072	0.29	292	330
3.5Cx150/70	18/12	1.4/1.1	0.5	2.00	4x0.8	1.88	1.72	45.2	42.4	6523	5768	2.4	42.8	5416	0.124	0.159	0.072	0.29	325	375
3.5Cx185/95	30/15	1.6/1.1	0.5	2.50	4x0.8	2.04	1.88	49.7	46.0	8325	7164	2.6	46.4	6791	0.0991	0.127	0.072	0.29	366	434
3.5Cx240/120	34/15	1.7/1.2	0.6	2.50	4x0.8	2.20	2.04	55.4	51.7	10510	9193	2.8	52.4	8812	0.0754	0.0965	0.072	0.31	421	515
3.5Cx300/150	34/15	1.8/1.4	0.6	2.50	4x0.8	2.36	2.20	59.3	55.6	12705	11282	3.0	56.4	10881	0.0601	0.0769	0.071	0.33	472	588
3.5Cx400/185	53/30	2.0/1.6	0.7	3.15	4x0.8	2.68	2.52	69.2	64.1	16653	14342	3.4	65.3	13914	0.0470	0.0602	0.070	0.33	528	677



**WIRE & CABLES**

**TORTEK**

## 4 CORE ALUMINIUM XLPE ARMoured POWER CABLES (A2XWY/A2XFY/A2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMoured								UNARMoured			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capacitance mfd/km	CURRENT RATINGS	
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diameter (Approx) mm	Net Wt. of Cable (Approx) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
4Cx4	1	0.7	0.3	1.40	-	1.24	-	16.5	-	542	-	1.8	14.8	257	7.41	9.48	0.0927	0.22	34	31
4Cx4	6	0.7	0.3	1.40	-	1.24	-	17.2	-	581	-	1.8	15.5	275	7.41	9.48	0.0927	0.22	34	31
4Cx6	1	0.7	0.3	1.40	-	1.24	-	17.8	-	625	-	1.8	16.0	308	4.61	5.90	0.0884	0.25	43	40
4Cx6	6	0.7	0.3	1.40	-	1.24	-	18.5	-	653	-	1.8	16.7	325	4.61	5.90	0.0884	0.25	43	40
4Cx10	1	0.7	0.3	1.40	-	1.40	-	20.5	-	837	-	1.8	17.9	400	3.08	3.94	0.0837	0.31	57	53
4Cx10	6	0.7	0.3	1.40	-	1.40	-	21.8	-	899	-	1.8	19.6	449	3.08	3.94	0.0837	0.31	57	53
4Cx16	6	0.7	0.3	1.60	4x0.8	1.40	1.40	22.8	21.2	896	686	1.8	21.0	257	1.91	2.45	0.0808	0.36	73	70
4Cx25	6	0.9	0.3	1.60	4x0.8	1.40	1.40	23.8	22.2	1051	829	2.0	22.4	618	1.20	1.54	0.0800	0.20	97	95
4Cx35	6	0.9	0.3	1.60	4x0.8	1.40	1.40	26.0	24.4	1236	992	2.0	24.6	763	0.868	1.11	0.0800	0.23	116	117
4Cx50	6	1.0	0.3	1.60	4x0.8	1.56	1.56	29.5	27.9	1525	1246	2.0	27.8	964	0.641	0.82	0.0780	0.24	134	140
4Cx70	12	1.1	0.4	2.00	4x0.8	1.56	1.56	34.1	31.7	2132	1606	2.2	32.0	1321	0.443	0.567	0.0770	0.26	167	176
4Cx95	15	1.1	0.4	2.00	4x0.8	1.72	1.56	37.9	35.2	2606	1975	2.2	35.5	1681	0.320	0.410	0.0740	0.29	199	221
4Cx120	15	1.2	0.5	2.00	4x0.8	1.88	1.72	41.9	39.1	3102	2422	2.4	39.5	2103	0.253	0.325	0.0720	0.29	227	258
4Cx150	15	1.4	0.5	2.50	4x0.8	2.04	1.88	46.3	42.6	3985	2892	2.6	43.0	2551	0.206	0.265	0.0720	0.29	255	294
4Cx185	30	1.6	0.5	2.50	4x0.8	2.20	2.04	51.5	47.8	4761	3542	2.8	48.3	3164	0.164	0.211	0.0720	0.29	287	339
4Cx240	30	1.7	0.6	2.50	4x0.8	2.36	2.20	57.5	53.8	5824	4453	3.0	54.6	4067	0.125	0.162	0.0720	0.31	333	402
4Cx300	30	1.8	0.7	3.15	4x0.8	2.52	2.36	64.5	59.5	7518	5394	3.2	60.6	5012	0.100	0.130	0.0710	0.33	375	461
4Cx400	53	2.0	0.7	3.15	4x0.8	2.84	2.68	72.1	67.1	9176	6779	3.6	68.3	6373	0.0778	0.1023	0.0700	0.33	426	542



## 4 CORE COPPER XLPE ARMoured POWER CABLES (2XWY/2XFY/2XY)

No. of core & cross sectional area	Min. No. of Wires	Thick-ness of XLPE insulation (Nom.) mm	Min Thick-ness of PVC Inner Sheath mm	ARMURED								UNARMURED			Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx Reactance at 50 Hz Ohms/km	Approx Capac- itance mfd/km	CURRENT RATINGS	
				Nominal Dimen- sions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thick-ness of Outer Sheath mm	Overall Diam- eter (Ap- prox) mm	Net Wt. of Cable (Ap- prox) Kg/Km					Direct in Ground Amps	In Air Amps
				Wire mm	Strip mm	Wire mm	Strip mm	Wire mm	Strip mm	Wire (Kg. Km)	Strip (Kg. Km)									
4Cx4	1	0.7	0.3	1.40	-	1.24	-	16.5	-	641	-	1.8	14.8	356	4.61	5.90	0.0927	0.22	44	40
4Cx4	6	0.7	0.3	1.40	-	1.24	-	17.2	-	679	-	1.8	15.5	372	4.61	5.90	0.0927	0.22	44	40
4Cx6	1	0.7	0.3	1.40	-	1.24	-	17.8	-	773	-	1.8	16.0	445	3.08	3.94	0.0884	0.25	55	51
4Cx6	6	0.7	0.3	1.40	-	1.24	-	18.5	-	800	-	1.8	16.7	472	3.08	3.94	0.0884	0.25	55	51
4Cx10	6	0.7	0.3	1.40	-	1.40	-	21.8	-	1146	-	1.8	19.6	697	1.83	2.34	0.0837	0.31	73	70
4Cx16	6	0.7	0.3	1.60	4x0.8	1.40	1.40	22.8	21.2	1381	1149	1.8	21.0	843	1.15	1.47	0.080	0.36	97	90
4Cx25	6	0.9	0.3	1.60	4x0.8	1.40	1.40	23.8	22.2	1782	1536	2.0	22.4	1232	0.727	0.930	0.080	0.20	125	122
4Cx35	6	0.9	0.3	1.60	4x0.8	1.40	1.40	26.0	24.4	2230	1960	2.0	24.6	1620	0.524	0.671	0.080	0.23	148	148
4Cx50	6	1.0	0.3	1.60	4x0.8	1.56	1.56	29.5	27.9	2855	2545	2.0	27.8	2125	0.387	0.495	0.078	0.24	175	181
4Cx70	12	1.1	0.4	2.00	4x0.8	1.56	1.56	34.1	31.7	4048	3462	2.2	32.0	3000	0.268	0.343	0.077	0.26	213	230
4Cx95	15	1.1	0.4	2.00	4x0.8	1.72	1.56	37.9	35.2	5219	4535	2.2	35.5	4013	0.193	0.247	0.074	0.29	254	284
4Cx120	18	1.2	0.5	2.00	4x0.8	1.88	1.72	41.9	39.1	6373	5623	2.4	39.5	5043	0.153	0.196	0.072	0.29	292	330
4Cx150	18	1.4	0.5	2.50	4x0.8	2.04	1.88	46.3	42.6	7991	6809	2.6	43.0	6176	0.124	0.159	0.072	0.29	325	375
4Cx185	30	1.6	0.5	2.50	4x0.8	2.20	2.04	51.5	47.8	9755	8416	2.8	48.3	7701	0.0991	0.127	0.072	0.29	366	434
4Cx240	34	1.7	0.6	2.50	4x0.8	2.36	2.20	57.5	53.8	12360	10843	3.0	54.6	10037	0.0754	0.0965	0.072	0.31	421	515
4Cx300	34	1.8	0.7	3.15	4x0.8	2.52	2.36	64.5	59.5	15802	13402	3.2	60.6	12513	0.0601	0.0769	0.071	0.33	472	588
4Cx400	53	2.0	0.7	3.15	4x0.8	2.84	2.68	72.1	67.1	19582	16889	3.6	68.3	15945	0.0470	0.0602	0.070	0.33	528	677



**WIRE & CABLES**

**TORTEK**

## ARMoured PVC CONTROL CABLE IS : 1554 (P-I) - 1988 (YWY/YFY)

No. of Cores & Cross Sectional Area	Thickness of PVC insulation (Nom.)	Min. Thickness of Inner Sheath	Strip Armoured Cable				Wire Armoured Cable				Standard Delivery Length in Mtrs.	CURRENT RATINGS	
			Strip	Min. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Round Wire Dia	Min. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable		Direct in Ground	In Air
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km		Amps	Amps
2Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	13.6	415	1000	23	20
3Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	14.1	430	1000	21	17
4Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	15.0	490	1000	21	17
5Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	15.9	545	1000	16	14
6Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	16.9	605	1000	15	13
7Cx1.5	0.8	0.3	-	-	-	-	1.4	1.24	16.9	630	1000	14	13
10Cx1.5	0.8	0.3	-	-	-	-	1.4	1.40	20.6	835	1000	13	11
12Cx1.5	0.8	0.3	4x0.8	1.24	19.5	760	1.6	1.40	21.5	965	1000	12	10
14Cx1.5	0.8	0.3	4x0.8	1.40	20.8	830	1.6	1.40	22.4	1040	1000	11	10
16Cx1.5	0.8	0.3	4x0.8	1.40	21.7	920	1.6	1.40	23.3	1130	1000	11	9
19Cx1.5	0.8	0.3	4x0.8	1.40	23.1	1040	1.6	1.40	24.7	1265	1000	10	9
24Cx1.5	0.8	0.3	4x0.8	1.40	26.4	1250	1.6	1.40	28.0	1510	1000	9	8
27Cx1.5	0.8	0.3	4x0.8	1.40	26.9	1355	1.6	1.40	28.5	1610	1000	9	8
30Cx1.5	0.8	0.3	4x0.8	1.40	27.8	1430	1.6	1.40	29.4	1700	1000	9	7
37Cx1.5	0.8	0.3	4x0.8	1.40	29.7	1670	1.6	1.40	31.3	1960	1000	8	7
2Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	14.8	500	1000	32	27
3Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	15.4	520	1000	27	24
4Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	16.4	590	1000	27	24
5Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	17.5	660	1000	23	19
6Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	18.7	745	1000	21	18
7Cx2.5	0.9	0.3	-	-	-	-	1.4	1.24	18.7	780	1000	20	17
10Cx2.5	0.9	0.3	4x0.8	1.40	21.8	900	1.6	1.4	23.4	1110	1000	18	15
12Cx2.5	0.9	0.3	4x0.8	1.40	22.8	1020	1.6	1.4	24.4	1240	1000	17	14
14Cx2.5	0.9	0.3	4x0.8	1.40	23.8	1130	1.6	1.4	25.4	1340	1000	16	13
16Cx2.5	0.9	0.3	4x0.8	1.40	24.9	1210	1.6	1.4	26.5	1455	1000	15	13
19Cx2.5	0.9	0.3	4x0.8	1.40	26.1	1355	1.6	1.4	27.7	1605	1000	14	12
24Cx2.5	0.9	0.3	4x0.8	1.40	30.0	1655	1.6	1.56	32.0	1970	1000	13	11
27Cx2.5	0.9	0.3	4x0.8	1.40	30.6	1770	1.6	1.56	32.6	2100	1000	12	10
30Cx2.5	0.9	0.3	4x0.8	1.56	32.0	1940	1.6	1.56	33.6	2250	1000	12	10
37Cx2.5	0.9	0.4	4x0.8	1.56	34.7	2300	2.0	1.56	37.1	2900	1000	11	9

### Construction

1. Solid / Stranded annealed copper conductor & Tinned / Bare	4. FRLS / General Purpose PVC inner sheath
2. General Purpose / HR PVC insulation	5. Armouring round Galvanised Steel wires / strips
3. Core laid up (filled if needed)	6. FRLS / General Purpose PVC Outer sheath

### Max. Conductor D.C. Resistance at 20 Deg C - Conductor Size:

1.5 sq.mm - 12.1 Ohms / Km (Bare), 12.2 Ohms / Km (Tinned)

2.5 sq.mm - 7.41 Ohms / Km (Bare), 7.56 Ohms / Km (Tinned)

\* Dimensions specified are with stranded conductor.



# WIRE & CABLES

## UNARMoured PVC CONTROL CABLE IS : 1554 (P-I) - 1988 (YY)

No. of Cores & Cross Sectional Area mm <sup>2</sup>	Thickness of PVC insulation (Nom.) mm	Min. Thickness of Inner sheath mm	Nom. Thickness of PVC Outer Sheath mm	Overall Diameter (Approx.) mm	Approx. Net Wt. of Cable Kg/Km	Standard Delivery Length in Mtrs.	CURRENT RATINGS	
							Direct in Ground Amps	In Air Amps
2Cx1.5	0.8	0.3	1.8	11.8	185	1000	23	20
3Cx1.5	0.8	0.3	1.8	12.3	190	1000	21	17
4Cx1.5	0.8	0.3	1.8	13.2	225	1000	21	17
5Cx1.5	0.8	0.3	1.8	14.1	260	1000	16	14
6Cx1.5	0.8	0.3	1.8	15.1	295	1000	15	13
7Cx1.5	0.8	0.3	1.8	15.1	315	1000	14	13
10Cx1.5	0.8	0.3	1.8	18.4	425	1000	13	11
12Cx1.5	0.8	0.3	1.8	18.9	480	1000	12	10
14Cx1.5	0.8	0.3	1.8	19.8	535	1000	11	10
16Cx1.5	0.8	0.3	1.8	20.7	595	1000	11	9
19Cx1.5	0.8	0.3	2.0	22.5	720	1000	10	9
24Cx1.5	0.8	0.3	2.0	25.8	880	1000	9	8
27Cx1.5	0.8	0.3	2.0	26.3	960	1000	9	8
30Cx1.5	0.8	0.3	2.0	27.2	1040	1000	9	7
37Cx1.5	0.8	0.3	2.0	29.1	1230	1000	8	7
2Cx2.5	0.9	0.3	1.8	13.0	230	1000	32	27
3Cx2.5	0.9	0.3	1.8	13.6	240	1000	27	24
4Cx2.5	0.9	0.3	1.8	14.6	290	1000	27	24
5Cx2.5	0.9	0.3	1.8	15.7	335	1000	23	19
6Cx2.5	0.9	0.3	1.8	16.9	385	1000	21	18
7Cx2.5	0.9	0.3	1.8	16.9	420	1000	20	17
10Cx2.5	0.9	0.3	1.8	20.8	570	1000	18	15
12Cx2.5	0.9	0.3	2.0	22.2	690	1000	17	14
14Cx2.5	0.9	0.3	2.0	23.2	775	1000	16	13
16Cx2.5	0.9	0.3	2.0	24.3	860	1000	15	13
19Cx2.5	0.9	0.3	2.0	25.5	985	1000	14	12
24Cx2.5	0.9	0.3	2.0	29.4	1215	1000	13	11
27Cx2.5	0.9	0.3	2.0	30.0	1330	1000	12	10
30Cx2.5	0.9	0.3	2.0	31.0	1450	1000	12	10
37Cx2.5	0.9	0.4	2.2	34.1	1790	1000	11	9

### Construction

1. Solid / Stranded annealed copper conductor & Tinned / Bare	4. FRLS / General Purpose PVC inner sheath
2. General Purpose / HR PVC insulation	5. Armouring round Galvanised Steel wires / strips
3. Core laid up (filled if needed)	6. FRLS / General Purpose PVC Outer sheath

### Max. Conductor D.C. Resistance at 20 Deg C - Conductor Size:

1.5 sq.mm - 12.1 Ohms / Km (Bare), 12.2 Ohms / Km (Tinned)

2.5 sq.mm - 7.41 Ohms / Km (Bare), 7.56 Ohms / Km (Tinned)

\* Dimensions specified are with stranded conductor.



## ARMoured XLPE CONTROL CABLE IS : 7098 (P-I) - 1988 (2XWY/2XFY)

No. of Cores & Cross Sectional Area	Thickness of XLPE insulation (Nom.)	Min. Thickness of Inner sheath	Strip Armoured Cable				Wire Armoured Cable				Standard Delivery Length in Mtrs.	CURRENT RATINGS	
			Strip	Min. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Round Wire Dia	Min. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Ne Wt. of Cable		Direct in Ground	In Air
			mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km		Amps	Amps
2Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	13.2	410	1000	33	29
3Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	13.6	453	1000	25	22
4Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	14.4	503	1000	25	22
5Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	15.2	507	1000	24	21
6Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	16.0	558	1000	22	19
7Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	16.0	576	1000	21	18
10Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	18.9	746	1000	18	16
12Cx1.5	0.7	0.3	-	-	-	-	1.4	1.24	19.4	799	1000	17	15
14Cx1.5	0.7	0.3	-	-	-	-	1.4	1.4	20.5	874	1000	16	14
16Cx1.5	0.7	0.3	4x0.8	1.40	20.1	816	1.6	1.4	21.7	1021	1000	16	14
19Cx1.5	0.7	0.3	4x0.8	1.40	21.0	880	1.6	1.4	22.6	1120	1000	15	13
24Cx1.5	0.7	0.3	4x0.8	1.40	24.3	1102	1.6	1.4	25.9	1357	1000	13	12
27Cx1.5	0.7	0.3	4x0.8	1.40	24.7	1162	1.6	1.4	26.3	1433	1000	13	11
30Cx1.5	0.7	0.3	4x0.8	1.40	25.5	1251	1.6	1.4	27.1	1512	1000	12	11
37Cx1.5	0.7	0.3	4x0.8	1.40	27.2	1425	1.6	1.4	28.8	1724	1000	11	10
44Cx1.5	0.7	0.3	4x0.8	1.40	30.0	1639	1.6	1.56	32.0	1996	1000	11	9
52Cx1.5	0.7	0.3	4x0.8	1.56	31.6	1855	1.6	1.56	33.2	2205	1000	10	9
61Cx1.5	0.7	0.3	4x0.8	1.56	33.3	2092	2.0	1.56	35.7	2687	1000	9	8
2Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	14.0	460	1000	39	32
3Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	14.5	526	1000	34	30
4Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	15.3	602	1000	34	30
5Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	16.3	602	1000	31	28
6Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	17.2	664	1000	29	26
7Cx2.5	0.7	0.3	-	-	-	-	1.4	1.24	17.2	692	1000	27	25
10Cx2.5	0.7	0.3	4x0.8	1.40	19.7	773	1.6	1.4	21.3	987	1000	24	21
12Cx2.5	0.7	0.3	4x0.8	1.40	22.2	860	1.6	1.4	21.8	1064	1000	22	20
14Cx2.5	0.7	0.3	4x0.8	1.40	21.2	925	1.6	1.4	22.7	1160	1000	21	19
16Cx2.5	0.7	0.3	4x0.8	1.40	22.0	1017	1.6	1.4	23.6	1259	1000	20	18
19Cx2.5	0.7	0.3	4x0.8	1.40	23.4	1157	1.6	1.4	25.0	1406	1000	19	17
24Cx2.5	0.7	0.3	4x0.8	1.40	26.7	1413	1.6	1.4	28.3	1696	1000	17	16
27Cx2.5	0.7	0.3	4x0.8	1.40	27.2	1502	1.6	1.4	28.8	1800	1000	16	16
30Cx2.5	0.7	0.3	4x0.8	1.40	28.0	1622	1.6	1.4	29.6	1912	1000	16	14
37Cx2.5	0.7	0.3	4x0.8	1.40	30.0	1866	1.6	1.56	32.0	2223	1000	15	13
44Cx2.5	0.7	0.4	4x0.8	1.56	33.6	2209	2.0	1.56	36.0	2829	1000	14	12
52Cx2.5	0.7	0.4	4x0.8	1.56	35.0	2475	2.0	1.56	37.4	3119	1000	13	12
61Cx2.5	0.7	0.4	4x0.8	1.56	36.9	2777	2.0	1.56	39.3	3470	1000	12	11

### Construction

1. Solid / Stranded annealed copper conductor & Tinned / Bare	4. FRLS / General Purpose PVC inner sheath
2. Cross linked Polyethylene (XLPE) insulation	5. Armouring round Galvanised Steel wires / strips
3. Core laid up (filled if needed)	6. FRLS / General Purpose PVC Outer Sheath



# WIRE & CABLES

## UNARMoured XLPE CONTROL CABLE IS : 7098 (P-I) - 1988 (2XY)

No. of Cores & Cross Sectional Area No mm <sup>2</sup>	Thickness of XLPE insulation (Nom.) mm	Min. Thickness of Inner sheath mm	Nom. Thickness of PVC Outer Sheath mm	Overall Diameter (Approx.) mm	Approx. Ne Wt. of Cable Kg/Km	Standard Delivery Length in Mtrs.	CURRENT RATINGS	
							Direct in Ground Amps	In Air Amps
2Cx1.5	0.7	0.3	1.8	10.0	140	1000	33	29
3Cx1.5	0.7	0.3	1.8	10.5	160	1000	25	22
4Cx1.5	0.7	0.3	1.8	11.5	200	1000	25	22
5Cx1.5	0.7	0.3	1.8	12.5	225	1000	24	21
6Cx1.5	0.7	0.3	1.8	13.5	250	1000	22	19
7Cx1.5	0.7	0.3	1.8	13.5	260	1000	21	18
10Cx1.5	0.7	0.3	1.8	17.0	340	1000	18	16
12Cx1.5	0.7	0.3	1.8	17.5	390	1000	17	15
14Cx1.5	0.7	0.3	1.8	18.0	430	1000	16	14
16Cx1.5	0.7	0.3	1.8	18.5	475	1000	16	14
19Cx1.5	0.7	0.3	1.8	19.5	540	1000	15	13
24Cx1.5	0.7	0.3	2.0	22.5	665	1000	13	12
27Cx1.5	0.7	0.3	2.0	23.0	750	1000	13	11
30Cx1.5	0.7	0.3	2.0	23.5	820	1000	12	11
37Cx1.5	0.7	0.3	2.0	25.0	975	1000	11	10
44Cx1.5	0.7	0.3	2.0	28.0	1150	1000	11	9
52Cx1.5	0.7	0.3	2.0	29.0	1300	1000	10	9
61Cx1.5	0.7	0.4	2.2	31.0	1500	1000	9	8
2Cx2.5	0.7	0.3	1.8	11.5	185	1000	38	32
3Cx2.5	0.7	0.3	1.8	12.0	220	1000	34	30
4Cx2.5	0.7	0.3	1.8	13.0	260	1000	34	30
5Cx2.5	0.7	0.3	1.8	14.0	300	1000	31	28
6Cx2.5	0.7	0.3	1.8	15.0	340	1000	29	26
7Cx2.5	0.7	0.3	1.8	15.0	360	1000	27	25
10Cx2.5	0.7	0.3	1.8	17.5	475	1000	24	21
12Cx2.5	0.7	0.3	1.8	18.0	550	1000	22	20
14Cx2.5	0.7	0.3	1.8	19.0	625	1000	21	19
16Cx2.5	0.7	0.3	2.0	20.5	680	1000	20	18
19Cx2.5	0.7	0.3	2.0	21.5	770	1000	19	17
24Cx2.5	0.7	0.3	2.0	24.5	950	1000	17	16
27Cx2.5	0.7	0.3	2.0	25.5	1050	1000	16	16
30Cx2.5	0.7	0.3	2.0	26.0	1150	1000	16	14
37Cx2.5	0.7	0.3	2.0	28.0	1350	1000	15	13
44Cx2.5	0.7	0.4	2.2	32.0	1650	1000	14	12
52Cx2.5	0.7	0.4	2.2	33.5	1950	1000	13	12
61Cx2.5	0.7	0.4	2.2	35.0	2150	1000	12	11

### Construction

1. Solid / Stranded annealed copper conductor & Tinned / Bare	4. FRLS / General Purpose PVC inner sheath
2. Cross linked Polyethylene (XLPE) insulation	5. Armouring round Galvanised Steel wires / strips
3. Core laid up (filled if needed)	6. FRLS / General Purpose PVC Outer sheath

### Max. Conductor D.C. Resistance at 20 Deg C - Conductor Size:

1.5 sq.mm - 12.1 Ohm / Km (Bare), 12.2 Ohm / Km (Tinned)

2.5 sq.mm - 7.41 Ohm / Km (Bare), 7.56 Ohm / Km (Tinned)

\* Dimensions specified are with stranded conductor.

## Flexible Multicore / Singlecore wires & cable as per IS - 694 (1990/2010)

**Table-1 : Single core / Multicore flexible industrial cables as per IS 694 : 1990/2010, Voltage Grade upto 1100 / 750 volts**

mm		Area Sq.	0.5	0.75	1.0	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0	50.0
	No. & Size of Wire (Nom.)	No. / mm	16/2	24/2	32/2 OR 14/3	30/25 OR 22/3	50/25 OR 36/3	56/3	84/3	80/4 OR 140/3	126/4	196/4	276/4	396/4
CONDUCTOR	RESISTANCE (MAX.) @ 20°C	Ohms/km	39.0	26.0	19.5	13.3	7.98	4.95	3.30	1.91	1.21	0.780	0.554	0.386
	CURRENT RATING DC or AC	Amps	4	7	12	15	20	27	35	46	62	80	102	138
INSULATION	THICKNESS (Nom.)	mm	0.6	0.6	0.6	0.6	0.7	0.8	0.8	1.0	1.0	1.2	1.2	1.4
SINGLE CORE UN- SHEATHED	OVERALL DIAMETER (Approx.)	mm	2.00	2.30	2.45	2.75	3.50	4.10	4.75	6.30	7.25	8.80	10.35	12.25
SINGLE CORE SHEATHED	SHEATH THICKNESS (Nom.) OVERALL DIAMETER (Approx.)	mm	0.9 4.00	0.9 4.25	0.9 4.50	0.9 4.80	1.0 5.45	1.0 6.30						
TWIN FLAT SHEATHED	OVERALL WIDTH (Approx.) OVERALL HEIGHT (Approx.)	mm	6.2 4.0	6.7 4.25	- -	- -	- -	- -						
2 CORE	SHEATH THICKNESS (Nom.) OVERALL DIAMETER (Approx.)	mm	0.9 6.1	0.9 6.7	0.9 7.0	0.9 7.6	1.0 9.1	1.0 10.5						
3 CORE	SHEATH THICKNESS (Nom.) OVERALL DIAMETER (Approx.)	mm	0.9 6.4	0.9 7.1	0.9 7.4	0.9 8.0	1.0 9.6	1.0 11.4						
4 CORE	SHEATH THICKNESS (Nom.) OVERALL DIAMETER (Approx.)	mm	0.9 6.9	0.9 7.7	0.9 8.1	1.0 9.2	1.0 10.7	1.0 12.4						
5 CORE	SHEATH THICKNESS (Nom.) OVERALL DIAMETER (Approx.)	mm	0.9 7.5	0.9 8.3	1.0 9.1	1.0 9.9	1.0 11.7	1.1 13.8						

**Note:** The conductor construction given above is indicative only and will be such that all requirements of strand diameter and conductor resistance as per IS 694 and IS 8130 are met.

**Table-2 : Single core flexible industrial cables generally conforming to IS 694 : 1990/2010, Voltage Grade upto 1100 / 750 volts**

Description			70.0	95.0	120.0	150.0	185.0	240.0
	No. & Size of Wire (Nom.)	No. / mm	360/5	475/5	608/5	750/5	925/5	1221/5
CONDUCTOR	RESISTANCE (MAX.) @ 20°C	Ohms/km	0.272	0.206	0.161	0.129	0.106	0.0801
	CURRENT RATING DC / AC	Amps	214	260	305	355	415	500
INSULATION	THICKNESS (Nom.)	mm	1.4	1.6	1.6	1.8	2.0	2.2
	OVERALL DIAMETER (Approx.)	mm	13.9	15.9	17.8	19.8	22.0	26.0



## WIRE & CABLES

**Table-3 : Flexible multicore industrial cables (6 cores to 19 cores) generally conforming to IS 694 : 1990 / 2010, Voltage Grade upto 1100 / 750 volts**

Core	Description	0.5	0.75	1.0	1.5	2.5	4.0
6	SHEATH THICKNESS (Nom.) mm	0.9	1.0	1.0	1.0	1.1	1.2
	OVERALL DIAMETER (Approx.) mm	8.1	9.4	9.8	10.7	12.9	16.0
7	SHEATH THICKNESS (Nom.) mm	0.9	1.0	1.0	1.0	1.1	1.2
	OVERALL DIAMETER (Approx.) mm	8.1	9.4	9.8	10.7	12.9	16.0
8	SHEATH THICKNESS (Nom.) mm	1.0	1.0	1.0	1.1	1.2	1.3
	OVERALL DIAMETER (Approx.) mm	9.4	10.4	10.9	12.2	14.6	17.0
10	SHEATH THICKNESS (Nom.) mm	1.0	1.1	1.1	1.1	1.3	1.4
	OVERALL DIAMETER (Approx.) mm	10.5	11.9	12.5	13.7	16.7	19.5
12	SHEATH THICKNESS (Nom.) mm	1.0	1.1	1.1	1.1	1.3	1.4
	OVERALL DIAMETER (Approx.) mm	10.8	12.3	12.9	14.1	17.3	20.5
14	SHEATH THICKNESS (Nom.) mm	1.1	1.1	1.1	1.2	1.3	1.4
	OVERALL DIAMETER (Approx.) mm	11.5	12.8	13.5	15.0	18.1	22.5
16	SHEATH THICKNESS (Nom.) mm	1.1	1.2	1.2	1.2	1.4	1.5
	OVERALL DIAMETER (Approx.) mm	12.1	13.7	14.4	15.8	19.3	24.0
19	SHEATH THICKNESS (Nom.) mm	1.1	1.2	1.3	1.3	1.4	1.5
	OVERALL DIAMETER (Approx.) mm	12.7	14.4	15.1	16.8	20.3	25.5

**Table-4 : Three & four flexible industrial cables for Voltage Grade upto 1100 / 750 volts**

	Description	6.0	10.0	16.0	25.0	35.0	50.0	70.0	95.0	120.0
	NO. & SIZE OF WIRE (No. / mm)	84 / 3	140 / 0.3 OR 80 / 4	226 / 3 OR 126 / 4	354 / 3 OR 196 / 4	495 / 3 OR 276 / 4	703 / 3 OR 396 / 4	360 / 5	475 / 5	608 / 5
Conductor	RESISTANCE (MAX.) @ 20°C (Ohms/Km)	3.30	1.91	1.21	0.78	0.554	0.386	0.272	0.206	0.161
	CURRENT RATING (Amps)	31	42	57	72	91	120	165	200	225
Insulation	THICKNESS (mm)	0.8	1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6
3 Core	SHEATH THICKNESS (Nom.) (mm)	1.3	1.4	1.4	1.5	1.6	2.0	2.2	2.4	2.5
	OVERALL DIAMETER (Approx.) (mm)	13.3	16.9	19.1	23.0	26.3	31.7	38.5	45.0	49.0
4 Core	SHEATH THICKNESS (Nom.) (mm)	1.4	1.4	1.4	1.6	1.7	2.0	2.2	2.4	2.5
	OVERALL DIAMETER (Approx.) (mm)	14.7	18.6	21.0	25.5	29.2	33.4	40.0	46.5	51.0

### For UPS Cables:

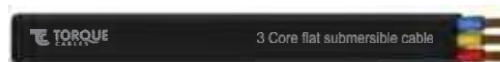
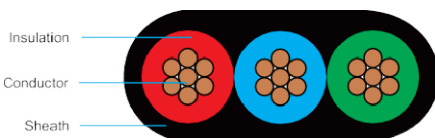
PVC insulated single core flexible cables in grey and with colour are ideal for use in cabling for UPS in establishment that have large computer networks. These unique colours can help identify the cabling for UPS wiring in the circuit and are available in sizes 0.5 sq. mm to 6.0 sq. mm. These cables conforming to IS 694:1990/2010 carry the prestigious ISI mark. **These cables can also be made available with FR or FRLS Insulating compound on request.** Technical details as per Table 1.

## Properties of Compounds

Feature	Normal PVC Wire	Heat Resistant HR PVC	Fire Resistant FR PVC	Flame Resistant Low Smoke FRLS	zero Halogen Low Smoke
Insulation Material	PVC	PVC	Spl. PVC	Spl. PVC	Spl. Polymer
Insulation Property	Normal	Good	Good	Good	Very Good
Temperature Rating	70°C	85°C	70°C	70°C	85°C
Thermal Stability	Normal	Very Good	Good	Good	Very Good
Flame Retardant	Good	Good	Very Good	Very Good	Excellent
Safety during burning	Average	Average	Good	Good	Excellent
Requirement of oxygen to catch fire (% in air)	>21	>21	>30	>30	>35
Temperature required to catch fire (with 21% oxygen)	Room Temp.	Room Temp.	>250°C	>250°C	>300°C
Visibility during cable burning (%)	<20	<20	<35	>40	>80
Release of halogen gas during burning (% by weight)	<20	<20	<20	<20	zero
Abrasion resistance during installation	Good	Good	Good	Good	Good

## 3 Core Flat Cables

Area (Nom.) sq. (mm)	Number / Size of wire (No. / mm)	Insulation Thickness (Nom.) (mm)	Sheath Thickness (Nom.) (mm)	Width 'W' (Approx) (mm)	Width 'T' (Approx) (mm)	Resistance at 20°C (Max.) (Ohm/Km)	Current carrying capacity at 40°C (Amps)
1.5	22/0.3	0.6	0.90	11.0	5.0	12.10	14
2.5	36/0.3	0.7	1.00	13.0	6.0	7.40	18
4.0	56/0.3	0.8	1.00	15.3	6.7	4.95	26
6.0	84/0.3	1.0	1.15	18.7	7.9	3.30	31
10.0	140/0.3	1.0	1.40	23.7	9.9	1.91	42
16.0	226/0.3	1.0	1.40	28.0	11.4	1.21	57
25.0	354/0.3	1.2	2.00	35.5	14.7	0.780	72
35.0	495/0.3	1.2	2.00	39.5	16.2	0.554	90
50.0	703/0.3	1.4	2.20	45.5	18.3	0.386	115
70.0	360/0.5	1.4	2.20	51.0	20.0	0.272	143
95.0	475/0.5	1.6	2.40	60.0	23.5	0.206	165





## WIRE & CABLES

**Table-5 : Colour Coding**

Type	Colours	
	Core	Sheath
Single Core Unsheathed	Red, Yellow, Blue, Black, White & Grey	
Single Core Sheathed	Black	Black
Twin Twisted	Red & Black	
Twin Flat Sheathed	Red & Black	Black
2-Core Round Sheathed	Red & Black	Black
3-Core Round Sheathed	Red, Black & Yellow / Green for earth	Black
4-Core Round Sheathed	Red, Yellow, Blue, & Yellow / Green for earth	Black
5-Core Round Sheathed	Red, Yellow, Blue, Black & Grey	Black

**Note:** Any required colour can be provided on specific request.

## Cables for Overseas Markets

Tortek cables have been used in many countries for over two decades. Cables can be offered to British or equivalent standards. Specifications for a representative single core range are given below:

**Table-6 : Single core unsheathed cables as per BS 6004**

Nominal Cross-Sectional Area of Conductor mm <sup>2</sup>	Radial Thickness of Insulation (Nom.) mm	Cables with Rigid (Solid / Stranded) Copper Conductor				Cables with Flexible Copper Conductor			
		Cable Code	Conductor Construction (No. / mm)	Conductor Resistance (Max.) at 20°C Ohms / Km	Overall Diameter (Max.) mm	Cable Code	Conductor Construction (No. / mm)	Conductor Resistance (Max.) at 20°C Ohms / Km	Overall Diameter (Max.) mm
0.50	0.6	H05V-U	1/0.80	36.0	2.3	H05V-K	16/0.2	39.0	2.6
0.75	0.6	H05V-U	1/0.97	24.5	2.5	H05V-K	24/0.2	26.0	2.8
1.0	0.6	H05V-U	1/1.13	18.1	2.7	H05V-K	32/0.2	19.5	3.0
1.5	0.7	H07V-R	7/0.53	12.1	3.3	H07V-K	30/0.25	13.3	3.4
2.5	0.8	H07V-R	7/0.67	7.41	4.0	H07V-K	50/0.25	7.98	4.1
4	0.8	H07V-R	7/0.85	4.61	4.6	H07V-K	56/0.3	4.95	4.8
6	0.8	H07V-R	7/1.04	3.08	5.2	H07V-K	84/0.3	3.30	5.3
10	1.0	H07V-R	7/1.35	1.83	6.7	H07V-K	80/0.4	1.91	6.8
16	1.0	H07V-R	7/1.70	1.15	7.8	H07V-K	126/0.4	1.21	8.1
25	1.2	H07V-R	7/2.14	0.727	9.7	H07V-K	196/0.4	0.780	10.2
35	1.2	H07V-R	7/2.52	0.524	10.9	H07V-K	276/0.4	0.554	11.7
50	1.4	H07V-R	19/1.78	0.387	12.8	H07V-K	396/0.4	0.386	13.9
70	1.4	H07V-R	19/2.14	0.268	14.6	H07V-K	360/0.5	0.272	16.0
95	1.6	H07V-R	19/2.52	0.193	17.1	H07V-K	475/0.5	0.206	18.2
120	1.6	H07V-R	37/2.03	0.153	18.8	H07V-K	608/0.5	0.161	20.2
150	1.8	H07V-R	37/2.25	0.124	20.9	H07V-K	750/0.5	0.129	22.5
185	2.0	H07V-R	37/2.52	0.0991	23.3	H07V-K	925/0.5	0.106	24.9
240	2.2	H07V-R	61/2.25	0.0754	26.6	H07V-K	1221/0.5	0.0801	28.4

**Note:** The conductor construction given above is indicative only and will be such that all requirements of BS 6360 are met.

■ **Harmonized code designations are described below :**

Cable Code	Type of Conductor	Voltage Grade
H05V-U	Solid	300/500 V
H05V-K	Flexible	300/500 V
H07V-R	Stranded	450/750 V
H07V-K	Flexible	450/750 V

- Solid Conductors are as per Class 1, Stranded Conductors are as per Class 2 and Flexible Conductors are as per Class 5 according to BS 6360.
- Cables up to and including 10 mm<sup>2</sup> can be offered with Solid Conductor also (harmonized code H07V-U).

**Other types of cables offered to overseas markets include :**

- Multicore sheathed cables as per BS 6004 or BS 6500, with stranded (Class 2) or Flexible (Class 5) conductors.
- HR PVC Insulated winding wires for submersible pump motors
- PVC Insulated and sheathed three core flat cables and three core round double sheathed cables for submersible pumps
- HR PVC Insulated single core flexible cables as per BS 6231 Type CK
- PVC Insulated auto and battery cables as per DIN 72551, JIS C 3406, JASO D 611, ISO 6722 and IS 2465.
- PVC Insulated and sheathed power and control cables as per BS 6346 and IEC 60502
- XLPE Insulated and sheathed power cables as per BS 5467 and IEC 60502

## Solar Cables

Solar photovoltaic industry gets more attention as the most promising environment- friendly industry, and it is expected to have the significant role in resolving the earth’s energy problem. As production costs diminish, users increasingly view these energy sources as clean, cheap and reliable. In this background, the demand for “SOLAR CABLE”, which is the current transmission medium of solar energy power generation, is expected to increase with the expansion of market.

### Special Properties of Solar Cables

- Lifetime reliability: lasts up to 30 years even under tough external conditions.
- Outdoor durability: resists extreme temperatures (-40°C to 120°C maximum at the core) and ozone resistant.
- UV resistance: full protection against ultraviolet rays.
- Halogen-free: Low Smoke Emission & Low Toxicity/Corrosivity during fire.
- Properties against fire: flame retardant, fire retardant.
- Flexibility and stripability: for fast and easy installation.
- Fully recyclable: in accordance with new environmental regulations.
- Easy installation with color identification (blue, red).
- Suitable to common connector types.

#### Constituents

Tortek Solar Cables are manufactured upto 240 Sq.mm with the following materials.

1. Annealed Tinned Copper Conductor
2. Cross Linked Polyolefin Compound
3. zero Halogen Polyolefin Compound

Required Features of Solar cable

#### Chemical Features

- Weather resistant
- Resistant to mineral oils
- Resistant to acids & alkaline

#### Thermal Features

- Maximum conductor temperature of operation-120°C during 20000 hours.
- Minimum operating temperature: - 40°C

#### Electrical Features

- Voltage rating: 1.5 (1.8) KV DC / 0.6/1.0 (1.2) KV AC
- High voltage test: 6.5 KV DC for 5 minutes.

#### Mechanical Features

- Resistant to Impact, tear & abrasion
- Minimum bending radius – 4 times of overall diameter.
- Safe pulling force -50 N/Sq.mm.





# WIRE & CABLES

## INSTRUMENTATION CABLES

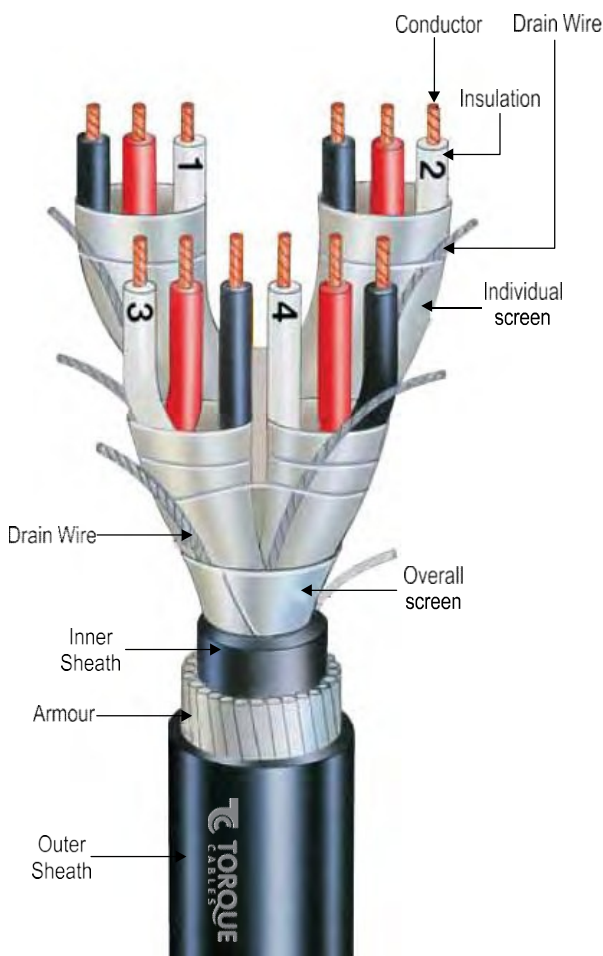
Instrumentation cables are multiple conductor cables that convey Low energy electrical signals used for monitoring or controlling electrical power systems and their associated processes.

These cables are used in diverse applications within industrial process manufacturing plant for control, communication, data (analog/digital) and voice transmission signals, industrial signaling and process control circuit required typically in process industries, oil, gas & petrochemical industry, fertilizers, cement, steel etc.

For Instrumentation cables screening plays a vital role; the AL-Mylar screen of the Instrumentation cables, designed and manufactured by Tortek Cables, captures the external noise pickups. Also, the ATC drain wire earths the noise pickups which would otherwise cause interference in the Low Level signals passed between the measuring end and display units. These cables are designed with a minimum overlap of 25% of the shield that ensures 100% coverage even when the cable is flexed.

The carefully produced stranded copper conductors used in the cable maintain high system accuracy and sensitivity. Maximum rejection of electro-magnetic noise is achieved by twisting the insulated conductors. Twisting causes the noise to be cancelled in adjacent sections of the wire.

Instrumentation cables are generally designed & manufactured based on BS EN 50288 (formerly BS 5308), EIL 6-52-46 and generally as per IS 1554-1, IS 7098-1, IEC 60502-1.



## CONSTRUCTION

### CONDUCTOR

Instrumentation cables are manufactured with Electrolytic Copper (Plain or Tinned) conductor in form of Solid (class 1), Stranded Circular (class 2) or flexible (class 5) as per IS 8130, IEC 60228 & BS EN 60228. Thermocouple Extension cables are manufactured with Solid (16 AWG, 18 AWG, 20 AWG) conductors depending on type of thermocouple i.e. K, E, T, J types as per ANSI MC 96.1, IEC 584 & IS 8784.

### INSULATION

Based on rated conductor temperature & electrical characteristics insulation materials such as PVC 70°C, HR PVC 85°C, XLPE 90°C or Polyethylene (70°C) are offered.

### INDIVIDUAL SCREEN

Twisted Pair or Triad are Individually shielded with Aluminium-Mylar tape along with ATC Drain wire in continuous contact with Aluminium side of the tape. Shielding of Copper tape can also be provided to meet specific requirements.

### PAIR/TRIAD IDENTIFICATION

Pair or Triad Identification can be done by numbered polyester tape applied over each pair / triad or by number printing on core of each pair / triad or by different colour coding.



## OVERALL SCREEN

Multi pair / Multitriad are laid up together and are shielded with Aluminium-Mylar tape alongwith ATC Drain wire in continuous contact with Aluminium side of the tape. Shielding of Copper tape can also be provided to meet specific requirements.

## INNER SHEATH

Extruded PVC / LSzH inner sheath is applied as a protection over the laid up pairs / triads.

## ARMOUR

Galvanized steel wire or strip are applied spirally over inner sheath as a mechanical protection for cable.

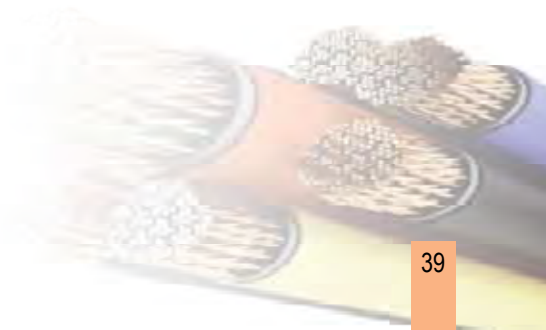
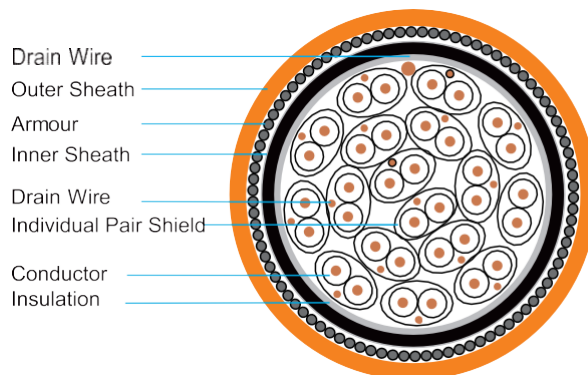
## OUTER SHEATH

Extruded sheath is provided depending on the application requirements such as temperature, flame retardant (FR), reduced smoke & acid gas emission (FRLS), Halogen free (LSzH / zHFR).

## GENERAL PARAMETERS FOR INSTRUMENTATION CABLES

PARAMETER	UNIT	CONDUCTOR AREA				
		0.5 mm <sup>2</sup>	0.75mm <sup>2</sup>	1.0 mm <sup>2</sup>	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
Maximum D.C. Resistance of plain copper conductor at 20°C	Ω/km	39.7	26.5	18.5	12.3	7.56
Maximum D.C. Resistance of Tinned copper conductor at 20°C	Ω/km	40.5	27.0	18.9	12.5	7.7
Maximum D.C. Resistance of 0.5mm ATC Drain wire at 20°C	Ω/km	30	30	30	30	30
Maximum mutual capacitance core to core (PVC insulated)	nF/km	250	250	250	250	250
Maximum mutual capacitance core to core (PE, XLPE insulated)	nF/km	115	115	115	115	115
L/R ratio maximum	μH/ohm	25	25	30	40	70
Electrostatic Noise Rejection Ratio as per IEEE Vol3 (minimum)	dB	76	76	76	76	76
Minimum Insulation Thickness	mm	0.44	0.44	0.44	0.44	0.53
Minimum Insulation Resistance at 27°C (PVC insulated) at 500V	MΩ/km	10	10	10	10	10
Minimum Insulation Resistance at 27°C (PE, XLPE insulated) at 500V	MΩ/km	100	100	100	100	100
High Voltage test	kV	1kV for 1 minute				

Instrumentation cables can be specially designed to meet specific requirements of Capacitance, L/R ratio etc.





# WIRE & CABLES

## THERMOCOUPLE EXTENSION & COMPENSATING CABLES

The construction of thermocouples extension & compensating cables is identical to instrumentation cables. These cables are used to pass the EMF signal from the thermocouple end to the control panel. The thermo-electric properties of the conductors used for these cables are the same as that of the thermocouple used for sensing the temperature.

Thermocouple extension & compensating cables are generally designed & manufactured based on BS EN 50288 (formerly BS 5308), EIL 6-52-45, ANSI MC 96.1, IEC 60584, IS 8784 and generally as per IS 1554-1, IS 7098-1, IEC 60502-1.

### GENERAL DETAILS FOR THERMOCOUPLE EXTENSION & COMPENSATING CABLES

TYPE	CONDUCTOR COMBINATIONS		ANSI MC 96.1			IEC 60584-3		
			COLOUR CODE		EMF TOLERANCE ± °C	COLOUR CODE		EMF TOLERANCE ± °C
	+VE	-VE	+VE	-VE		+VE	-VE	
Kx	Nickel - Chromium (Chromel)	Nickel- Aluminium (Alumel)	Red	Green	2.2	Green	White	2.5
Ex	Nickel - Chromium (Chromel)	Copper-Nickel (Constantan)	Red	Violet	1.7	Violet	White	2.5
Tx	Copper	Copper-Nickel (Constantan)	Red	Black	1.0	Brown	White	1.0
Jx	Iron	Copper-Nickel (Constantan)	Red	Blue	2.2	Black	White	2.5
Vx (KxA)	Copper	Copper-Nickel (Constantan)	-	-	-	Brown	White	2.5
Rxa / Sxa	Copper	Copper-Nickel (Constantan)	Red	White	1.5		White	2.5

### MAXIMUM D.C LOOP RESISTANCE FOR THERMOCOUPLE CONDUCTORS AT 20°C Ω /KM

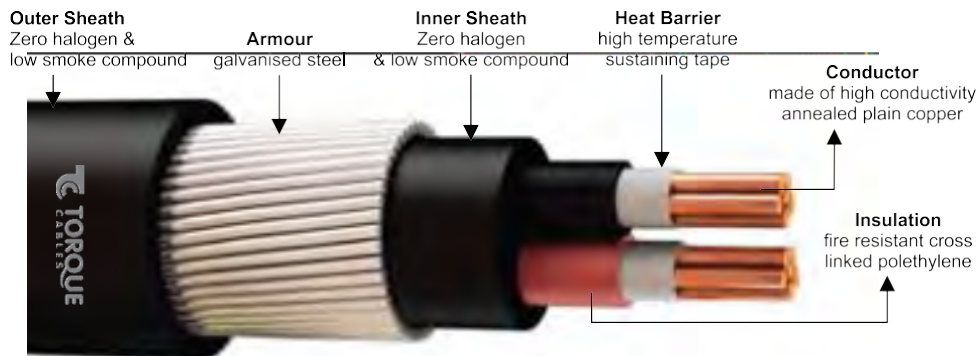
CONDUCTOR SIZE	Kx	Ex	Tx	Jx	Vx (KxA)	Rx / Sx
16 AWG (1.29mm)	746	905	385	475	385	110
18 AWG (1.02mm)	1210	1470	623	770	623	175
20 AWG (0.81mm)	1910	2311	980	1212	980	280

## SPECIAL APPLICATION CABLES - FIRE SURVIVAL CABLES

Fire Survival Cables are manufactured with Glass Backed Mica Tape applied over conductor and are used where the applications require circuit integrity during a fire mainly in Fire Alarm systems, sprinkler systems in schools, hospitals, shopping malls, cinemas etc. The circuit integrity is maintained for 3 hours at 750°C.

### SPECIAL APPLICATION FIRE SURVIVAL CABLES

Heat Barrier Glass Backed Mica Tape applied over conductor to meet the test requirements of 750°C for 3 hours as per IEC 60331.



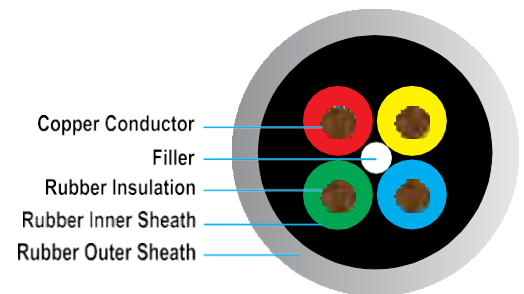
## RUBBER CABLES

In keep with the company's commitment to technological advancement, elastomer material such as Polychloroprene (PCP). Chloro-Sulphonated Polyethelene (CSP). Nitrile Rubber / PVC blends, Ethylene Propylene Rubber (EPR). Ethylene Vinyl Acetate (EVA) and Silicone have been specially compounded to meet numerous heat oil and fire resisting requirements. In the recent years TorteK Cables has also developed special Elastomeric Fire Survival Cables for power, control and instrumentation wiring.

Elastomeric compounds for insulating and sheathing of cables are formulated to meet the requirement of IS 6380, BS 6899, IEC 60502 and other international specification.

### GENERAL CONSTRUCTION (Conforming to IS 9968 Part I)

Conductor	Annealed tinned Copper wires Solid (Class I), Stranded (Class I), Standard (Class 2), Flexible (Class 5) complying with the requirement of IS 8130-1984.
Separator Tape	Suitable material separator tape may be applied over the conductor
Insulation	General service elastomer compound Type IE1 of IS 6380-1984 Heat Resisting elastomer compound type IE2 of IS 6380-1984 Silicon Rubber Type IE 5 of IS 6380-1984.
Core Identification	Coloured insulation, Nos. PE tape. Coloured proofed tape. Nos printing.
Fillers	Natural or synthetic fibres or elastomer suitable for the operating temperature and compatible with the insulating material.
Sheath	General service sheath type SE1/SE2 of IS 6380-1984 Heavy Duty Sheath Type SE3/SE4 of IS 6380-1984



### Working Temperature of Commonly used Elastomeric Insulating and Sheathing Materials

Material	Max. Cond. Temp. for continuous operations Deg C.	Max. Cond. Temp. for short circuit Deg C.	Min. Working Temp Deg C.
Ethylene Propylene Rubber (EPR)	90	250	-50
Polychloroprene (PCP)	70	200	-40
Chlorosulphonated Polyethylene (CSP)	90	200	-35
Silicone Rubber	150/180	350	55
Chloropropylene Ethylene (CPE)	90	250	-30
Styrene Butadiene Rubber	60	200	-55
NBR PVC	90	250	-30



# WIRE & CABLES

## LIST OF MACHINERY EQUIPMENT

S. No.	Machines	No.	S. No.	Machines	No.
1	120MM Complete Extrusion line with Progressive Length Marking	0 1	17	High Voltage Tester	0 1
2	100MM Complete Extrusion line with Progressive Length Marking	0 1	18	Water Bath	0 1
3	Extruder -65MM (UBR)	0 1	19	Compressor	0 2
4	Extruder -55MM (Windsor) + Extruder -45MM (PTC), Dual Extrusion Line	0 1	20	Vediojet Printing Machine (Black & White)	0 2
5	Mixture	0 2	21	Hydraulic Press	0 1
6	Bunchers (24 inch & 16 inch) with 19 Spools	0 2	22	Rolling Mill for PVC	0 1
7	6+1 Bobin Conductor (UBR Engg.)	0 1	23	Crane 5 Tons	0 2
8	Spark Tester - REX Instruments (0-25 KV and 0-15 KV)	0 2	24	Welding Set Machine	0 1
9	Cable rewinding machine	0 2	25	XLPE Curing Chamber	0 1
10	Lathe Machine	0 1	26	Butt Welder	0 2
11	Drill Machine	0 1	27	SLM Marking Machine	0 1
12	Laying Machine - 08 Drums (Shahi Cable)	0 1	28	Gas Cutter	0 1
13	Armouring - 45 bobbin (UBR Engg.) - 60 Spools	0 1	29	Coillier for Copper Rewinding Machine	0 1
14	Conductor Machine - 24 bobbin - 24 Spools	0 1	30	Weighing Balance - 2 Ton	0 1
15	Al. Drawing Machine - Tomer Engg.	0 1	31	Trolley - Capacity More than 1 Ton	0 1
16	Al. Break-down	0 1	32	Taping machine	0 2

## LIST OF LAB EQUIPMENT

S. No.	Description of the test equipment	Make	Range/Size	Least	Test Used
1	Digital vernier caliper	MITUTOYO	0-150 mm	0.01 mm	Measurement of thickness & outer dia.
2	Digital Micrometer	---DO---	0-25 mm	0.001 mm	Measurement of wire dia.
3	Tensile testing machine (Digital)	RANJANA	0-2500 N	IN	Tensile strength Elongation teat & annealing test
4	Dumb-bell cutting machine with die	---DO---	IS: 10810 (PT-VII)	---	Tensile strength & elongation
5	Hot air oven with digital temperature indicator	INSTAMES/S.V.	0-300°C	1°C	Heat shock, Hot deformation & shrinkage test
6	Thermal ageing four cell oven with digital temperature control, air flow meter & hour meter	RANJANA	0-300°C	0.1°C	After ageing Tensile Strength, Elongation Test & Loss of mass test
7	Water bath with digital temperature control, Pump & Hour meter	THERMOTECH	0-110°C	0.1°C	Water immersion A.C. & D.C. Test. Insulation Resistance & Volume Resistivity Test
8	Million Mega ohm Meter S. No. 2742	S.V	1-100x10 <sup>5</sup> MΩ (500 V DC)	Assorted	Insulation Resistance / volume Resistivity Test
9	Heat Shock Mandrels	---DO---	5-25 mm	---	Heat shock Test
10	Cold Bend Mandrels	---DO---	As Per IS: 10810 (PT-20)	---	Cold Bend Test
11	Cold Impact Apparatus	---DO---	As Per IS: 10810 (PT-21)	---	Cold Impact Test
12	Hot Deformation Apparatus with weigt	---DO---	0-850 g	---	Hot Deformation Test
13	Travelling Microscope with magnifying	SIGMA	10X H0-220 mm V0-150 mm	0.01 mm	Measurement of Thickness
14	Analytical Weighing Balance with weigt	MAXWELL	0-200 g	0.1 mg	Loss of mass Test & Thermal Stability
15	Double Kelvin Bridge with galvanomet Conductivity attachment, S. No. 1855	---DO---	0.2μΩ - 11Ω	0.2 μΩ	Conductor Resistance Test
16	Hydraulic press digital controller with Pressure Gauge	---DO---	0 - 300°C & 0-250 KN	0.1°C & 1.25 KN	For preparing FRLSH Sample
17	Flammability Test apparatus with gas burner, Scale	S.V. SCIENTIFIC	IS: 10810 (PT-53)	0.5 mm	Flammability Test
18	Conditioning Chamber with Humidity Control/Defreezer with digital temperature indicator	INSTAMES/ S.V.	(-20°C) - (+50°C) & 0-99%RH	0.1°C & 0.1%RH	Tensile strength Elongation Test cold Bend. Cold Impact test. Thermal Stability & hot set test
19	Torsion testing m/c with counter meter	GOLDEN STAR	0-9999 Count & 0-300 mm	1 Count & 0.5 mm	Torsion testing

**TORTEK**

20	D.C. High Voltage	--DO--	0-3 KV	0.1 KV	Water immersion D.C. Test
21	A.C. High Voltage with cage	S V	0-5/10KV	0.1/0.2 KV	High Voltage Test
22	H.V. Megha Ohm Box S. No. 1194	NUTAN	2MΩ - 2GΩ	Assorted	Insulation Resistance test
23	Thermometer	zEAL	-(10) - (110)°C & -(10) - (250)°C	1° & 1°	Conductor & Insulation Resistance test
24	Thermal stability test apparatus digital temp. indicator with PH Paper & Tubes	S.V. SCIENTIFIC	0-250°C	0.1°C	Thermal Stability test
25	Hot Set Test Apparatus with digital temp. indicator flow meter & weight	RANJANA ENGG.	0-300°C	0.1°C	Hot set test
26	Vacuum Oven with digital temperature control, Pump & Vacuum Gauge	RANJANA ENGG. & H GURU	0-200°C & 0-760 mm hg	1°C & 20 mm hg	Water Absorption test
27	Electronic Balance	CSI	0-5 Kg	0.5 gm	Flammability test
28	Desiccator	CORNY	As Per IS: 10810 (PT-33)	---	Water Absorption test
29	Stop Watch	RACER	0-10 Hours	0.01 Sec.	Flammability test, Thermal Stability
30	Scale	OMEGA	0-1000 mm 0-300 mm 0-150 mm	0.5 mm	Flammability test Shrinkage. Annealing & Elongation test
31	Die	RANJANA ENGG.	As Per IS: 10810 (PT-33)	---	Water Absorption test
32	Test for Smoke density	ASI / Mono meter/ ASI	0-18 Volt, 0-60 PSI & 0-9 Min.	0.1 Volt, 2 PSI & 1 Sec.	Testing for FRLS PVC
33	Test for Halogen Acid Gas Evaluation	Flowstar / UBLAL	0-2300 ML / MIN. & 0-999°C	10 ML / MIN. & 0.1°C	Pasting for FRLS PVC
34	Swedish Chimney test	RANJANA ENGG.	-	-	Testing for FRLS PVC
35	Oxygen Index with Temperature Index	Thermotech / Flowstar	0-300°C & 0-1 LTM	0.1°C & 0.05 LTM	Testing for FR, FRLS

## Handling, Storage and Laying of Tortek Cables

### A. CABLE INSPECTION

Inspect every cable reel for damage before accepting the shipment. Be particularly alert for cable damage if:

1. A reel is laying flat on its side.
2. Several reel are stacked.
3. Other freight is stacked on a reel.
4. Nails have been driven into reel flanges to secure shipping blocks.
5. A reel flange is damaged.
6. A cable covering is removed, stained or damaged.
7. A cable end seal is removed or damaged. A reel has been dropped (hidden damage likely).

### B. CABLE HANDLING & STORAGE

Damage to cables can occur due to the incorrect handling to which the drums and cables may be subjected; causing breakdown of the drum flanges and in exceptional case, movement of the drum barrel takes place. Once this breakdown of the drum occurs, the cable is immediately exposed to damage. Cable damaged during handling & storage can cause service failures when the subject cable is put to use.

Thus the following is a list of Do's and Don't that should be followed while handling and storing the cables before it is put to use.

### C. PRE-INSTALLATION

To ensure safety during cable installation, following shall be checked prior to installation.

1. The cable selected is proper for designed application.
2. The cable has not been damaged in transit or storage. Review all application state and national codes to verify that the cable chosen is appropriate for the job. Also consult your local electricity authority. Next, you must identify any existing cable damage and prevent any further damaged from occurring. This is done through proper cable inspection, handling and storage.

### D. INSTALLATION & LAYING

Mechanical stresses during installation are generally more severe than those encountered while in service. Thus care should be taken as regard to the following while installation and laying of cables.

1. Tortek recommend the laying and installation of cables as per IS:1255/84.
2. Care shall be taken during laying to avoid sharp bending, and twisting.
3. Cable shall be unwound from the drum by lifting the drum on the centre.



# WIRE & CABLES

## Do's

When off loading reels from a truck, lower reels carefully using a hydraulic gate, hoist or forklift truck.



If a fork lift is used, approach the reel from the flange side. Position the forks such that the reel is lifted by both reel flanges. Also Consideration should be given to, Traffic patterns during off-loading & damage during the time in storage.



Cable reels should be storage on hard surfaces resting on the flanges edge (flanges vertical). Align reels flange to flange and, if possible, arrange so that first in is firstout.



When using a hoist, install a mandrel through the reel arbor holes and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges.



## Don'ts

Never drop reels. If reels must be rolled, roll in opposite direction of the cable warps to keep cable from loosening on the reel.



Do not allow the lift forks to contact the cable. Care must be taken by the fork lifts operator not to make sudden turns of stops.



Multiple reels stacked on top of reach other ("pancake" storage) is not recommended for cable drums. The weight of the stack can total thousand of kgs. creating an enormous load on the bottom reel. Also, damage to the reel and/or cable will likely occur when the reel is flipped for transit. A concentration of stress on the reel flange may cause it to break and subsequently damage the cable.



This may lead to the bending of the reel flanges and mashing the cable.



4. Shaft supported both ends with suitable jacks/stands.
5. Under no circumstance the cable winding shall be lifted off a coil or drum laying flat at the flanges. This would cause serious twist and damages.
6. Suitable protection shall be provided to the cables against mechanical damages, it includes covers, pipes etc.

## E. RECOMMENDED MINIMUM BENDING RADIUS FOR HEAVY DUTY CABLES.

Single Core : 20 x D

Multicore: 15 x D

Where D = Diameter of cable in mm

## F. RECOMMENDED SAFE PULLING FORCE WITH STOCKINGS:

a) For Unarmoured Cable :  $P = 5 D^2$

b) For Armoured Cable:  $P = 9 D^2$

Where P = Pulling Force

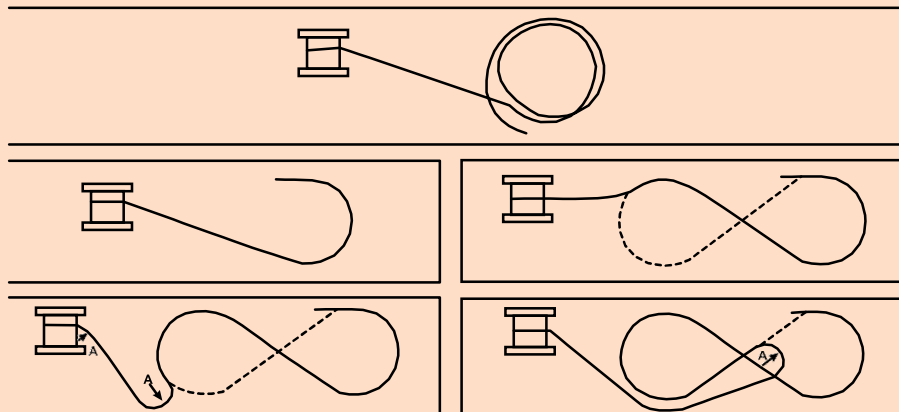
Where D = Diameter of cable in mm

## G. RECOMMENDED SAFE PULLING FORCE WHEN PULLED WITH PULLING EYE:

a) For Aluminum Conductor : 30 N/mm<sup>2</sup>

b) For Copper Conductor: 50 N/mm<sup>2</sup>

## DO NOT ATTEMPT "COILING" OF CABLE ON THE GROUND



ON THE GROUND CABLE CAN BE FLAKED IN A FIGURE OF EIGHT FORMATION

COMPARATIVE CHARACTERISTICS OF TYPICAL ELASTOMERIC AND THERMOPLASTIC INSULATING AND SHEATHING MATERIALS (I)

COMPARATIVE CHARACTERISTICS OF TYPICAL POLY VINYL CHLORIDE INSULATING AND SHEATHING MATERIALS (I)

MATERIAL	NEURAL RUBBER (MPPV 200)	EPN	EP	PCP	NBR/PVC	SILICONE	EVA	CHLOR. LUBRIF. P.V.C.	POLY-ETHYLENE	POSS. PROPYLENE	NYLON	ETFE	PEP	PFA	FLUOR. RUBBER (FEP)	POSS. BUTADIENE	PVC TYPE 6	PVC TYPE 7	PVC TYPE 8	PVC TYPE 9	PVC TYPE 10	PVC TYPE 11	PVC TYPE 12	PVC TYPE 13	PVC TYPE 14	PVC TYPE 15	PVC TYPE 16	PVC TYPE 17	PVC TYPE 18	PVC TYPE 19	PVC TYPE 20						
<b>USED AS INSULATION</b>	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE							
<b>USED AS SHEATH</b>	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE	GENERAL PURPOSE							
CONDUCTOR TEMPERATURE (2)	60	90	90	90	150	110/120	90	70	70	105	150	200	260	200	90	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70							
MAX. CONTINUOUS OPERATING TEMPERATURE (3)	200	250	250	250	350	250	250	250	250	300	400	450	550	220	220	220	160	160	160	160	160	160	160	160	160	160	160	160	160	160							
MIN. OPERATING TEMPERATURE (4)	-55	-40	-30	-30	-50	-45	-30	-30	-30	-40	-100	-100	-100	-45	-50	-50	-20	-20	-20	-25	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30							
MIN. INSTALLATION TEMPERATURE (5)	-55	-50	-30	-45	-30	-55	-40	-40	-40	-20	-150	-150	-150	-75	-75	-75	0	0	0	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10							
<b>RESISTANT TO :</b>																																					
: WATER																																					
: OIL																																					
: CHEMICAL																																					
: SOLVENT																																					
: OZONE																																					
: ABRASION																																					
: FLAME																																					
ELECTRICAL INSULATION RESISTANCE																																					
BREAKDOWN VOLTAGE																																					
A. C. LOSSES																																					
INDIAN STANDARD	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6474	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	IS-6390	
BRITISH STANDARD	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	BS-4899	

NOTE (1) GENERAL GUIDANCE ONLY. IN SPECIFIC CASES CONSULT THE MANUFACTURER.  
 (2) THESE ARE USED IN INSTRUMENTATION CABLES, WIDE SHORT CIRCUIT TEMP. ARE NOT RELEVANT. VALUES ARE GIVEN FOR REFERENCE ONLY.  
 (3) STYRENE BUTADIENE RUBBER  
 (4) POLYCHLOROPRENE  
 (5) ACRYLONITRILE BUTADIENE RUBBER / POLY VINYL CHLORIDE  
 (6) CHLOROSULPHONATED POLYETHYLENE  
 (7) ETHYLENE VINYL ACETATE  
 (8) COPOLYMER OF TETRAFLUORO ETHYLENE AND  
 POLYFLUORO ACET. VINYL ETHER  
 (9) POLYETHYLENE TEREPHTHALATE  
 (10) ETHYLENE TEREPHTHALATE  
 (11) ETHYLENE TEREPHTHALATE  
 (12) ETHYLENE TEREPHTHALATE  
 (13) ETHYLENE TEREPHTHALATE

