



ABHAR CABLE CO.



ISO 9002
Certificate No.
QS-1147HH



Accredited by the
Dutch Council for
Accreditation

AC ABHAR
CABLE



Telecommunication cables

Telecommunication cables are used in the low frequency systems, and are produced as pair or quad cables, using copper conductor.

These cables are for local networks and for transmission of signal and designed and manufactured by **AC** according to the specific requirements of the customers and international standards.

AC offers consultancy and solutions for the problems raised in the projects.



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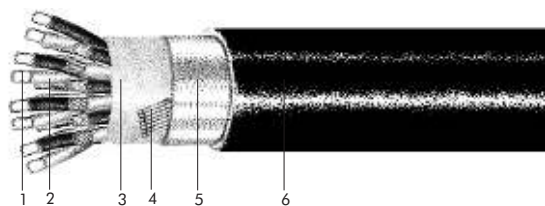
	CABLE TYPE	DESIGNATION	PAGE
TELECOMMUNICATION	UNARMoured	Cu/PVC/OSCR/PVC	1
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Cu/PE/OSCR/PVC

VDE0815

Description:

Twisted pair telecommunication cable with copper conductor and PVC insulation.



Number of Cores & Cross Section mm	Insulation Thickness mm	Sheath Thickness mm	Cable Diameter mm	Total Weight kg/km
1 x 2x0.8+1x 0.5 RE	0.4	1.4	7.8	70
2 x 2x0.8+1x 0.5 RE	0.4	1.4	10.8	100
5 x 2x0.8+1x 0.5 RE	0.4	1.4	13.3	180
7 x 2x0.8+1x 0.5 RE	0.4	1.4	14.4	220
10 x 2x0.8+1x 0.5 RE	0.4	1.4	17.1	290
15 x 2x0.8+1x 0.5 RE	0.4	1.6	20.0	410
20 x 2x0.8+1x 0.5 RE	0.4	1.6	22.5	520
25 x 2x0.8+1x 0.5 RE	0.4	1.8	25.0	650
30 x 2x0.8+1x 0.5 RE	0.4	1.8	27.0	750
40 x 2x0.8+1x 0.5 RE	0.4	2.0	30.8	980
50 x 2x0.8+1x 0.5 RE	0.4	2.0	33.9	1190

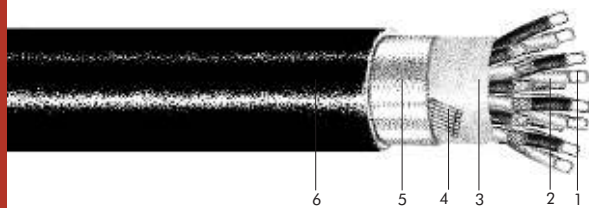
1-Copper Conductor 2-Polyvinylchloride Insulation 3-Polyester Tape

4-Tinned Drain Wire 5- Aluminium Polyester Tape 6-PVC Overall Sheath

Electrical Data

Electrical properties:	Unit	Values
Max. conductor DC resistance (Loop)	ohm/km	73.2
Min. insulation resistance	Mohm.km	100
Mutual capacitance	nF/km	120
Capacitance unbalance at 800Hz	pF/100m	200
Test voltage(wire to wire/core to screen)	V	500/2000
Operating voltage	V	225



**VDE0815**

Cu/PE/OSCR/PVC

Description:

Twisted pair telecommunication cable with copper conductor and PE insulation.

Number of Cores & Cross Section mm	Insulation Thickness mm	Sheath Thickness mm	Cable Diameter mm	Total Weight kg/km
1 x 2x0.9+1x 0.5 RE	0.4	1.4	7.4	60
2 x 2x0.9+1x 0.5 RE	0.4	1.4	10.1	90
5 x 2x0.9+1x 0.5 RE	0.4	1.4	12.4	160
7 x 2x0.9+1x 0.5 RE	0.4	1.4	13.3	190
10 x 2x0.9+1x 0.5 RE	0.4	1.4	15.8	250
15 x 2x0.9+1x 0.5 RE	0.4	1.4	18.0	340
20 x 2x0.9+1x 0.5 RE	0.4	1.4	20.2	430
25 x 2x0.9+1x 0.5 RE	0.4	1.4	22.2	520
30 x 2x0.9+1x 0.5 RE	0.4	1.8	24.8	650
40 x 2x0.9+1x 0.5 RE	0.4	1.8	28.0	830
50 x 2x0.9+1x 0.5 RE	0.4	1.8	30.7	1000

1-Copper Conductor 2-Polyethylene Insulation 3-Polyester Tape

4-Tinned Drain Wire 5-Aluminium Polyester Tape 6- PVC Overall Sheath

Electrical Data

Electrical properties:	Unit	Values
Max. conductor DC resistance	ohm/km	56.6
Min. insulation resistance	Mohm.km	10000
Mutual capacitance	nF/km	34±3.5
Test voltage(wire to wire/ wire to screen)	V	500/2000
Operating voltage	V	225

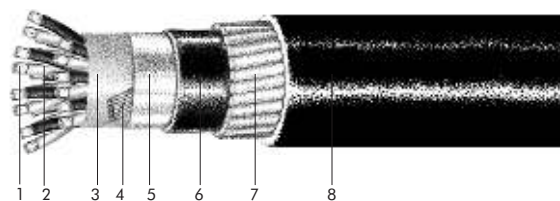
AC ABHAR CABLE

Cu/PE/OSCR/Bd/SWA/PVC

VDE0816-1

Description:

Wire armoured twisted pair telecommunication cable with copper conductor and PE insulation.



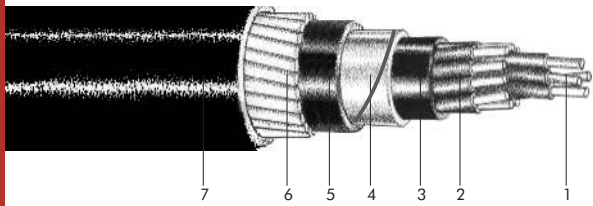
Number of Cores & Cross Section	Insulation Thickness	Wire armour Diameter	Sheath Thickness	Cable Diameter	Total Weight
mm	mm	mm	mm	mm	kg/km
1 x 2x0.9+1x 0.5 RE	0.4	0.8	1.8	17.7	240
2 x 2x0.9+1x 0.5 RE	0.4	0.8	1.8	15.4	340
5 x 2x0.9+1x 0.5 RE	0.4	0.8	1.8	17.6	450
7 x 2x0.9+1x 0.5 RE	0.4	0.8	1.8	18.6	510
10 x 2x0.9+1x 0.5 RE	0.4	1.25	1.8	22.1	780
15 x 2x0.9+1x 0.5 RE	0.4	1.25	1.8	24.2	930
20 x 2x0.9+1x 0.5 RE	0.4	1.6	1.8	27.2	1240
25 x 2x0.9+1x 0.5 RE	0.4	1.6	1.8	29.2	1400
30 x 2x0.9+1x 0.5 RE	0.4	1.6	1.8	31	1550
40 x 2x0.9+1x 0.5 RE	0.4	2	1.9	35.2	2080
50 x 2x0.9+1x 0.5 RE	0.4	2	2	38.1	2420

1-Copper Conductor 2-Polyethylene Insulation 3-Polyester Tape 4- Tinned Drain Wire
5- Aluminium Polyester Tape 6-Bedding 7-Galvanized Steel Wire Armour 8-PVC Overall Sheath

Electrical Data

Electrical properties:	Unit	Values
Max. conductor DC resistance	ohm/km	56.6
Min. insulation resistance	Mohm.km	10000
Max. Mutual capacitance	nF/km	34±3.5
Test voltage(wire to wire/ wire to screen)	V	500/2000
Operating voltage	V	225



**VDE0816-2**

Cu/PE/OSCR/Bd/SWA/PVC

Description:

Wire armoured signalling cable with copper conductor and PE insulation.

Number of Cores & Cross Section mm	Insulation Thickness mm	Armour Thickness mm	Sheath Thickness mm	Cable Diameter mm	Total Weight kg/km
2 x 0.9	0.5	1.25	1.4	15.0	250
4 x 0.9	0.5	1.25	1.4	15.8	290
6 x 0.9	0.5	1.25	1.4	16.9	340
8 x 0.9	0.5	1.25	1.4	18.9	390
10 x 0.9	0.5	1.25	1.4	19.9	440
12 x 0.9	0.5	1.25	1.4	20.2	460

1-Copper Conductor 2-Polyethylene Insulation 3-Bedding 4-Copper Tape Screen
5-Bedding 6- Galvanized Steel Wire Armour 7-PVC Overall Sheath

Electrical Data

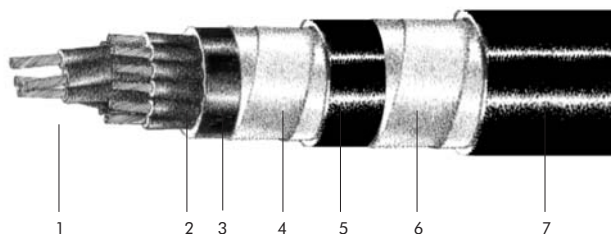
Electrical properties:	Unit	Values
Max. conductor DC resistance	ohm/km	28.9
Min. insulation resistance	Mohm.km	5000
Max. Mutual capacitance	nF/km	100
Test voltage	V	2500
Operating voltage	V	600

Cu/PE/Bd/CTS/Bd/STA/PVC

VDE0816-2

Description:

Tape armoured signalling cable with copper conductor and PE insulation.



Number of Cores & Cross Section mm	Insulation Thickness mm	Armour Diameter mm	Sheath Thickness mm	Cable Diameter mm	Total Weight kg/km
8 x 1.4	0.6	0.5	1.4	21.0	770
10 x 1.4	0.6	0.5	1.4	22.4	870
20 x 1.4	0.6	0.5	1.8	26.9	1260
30 x 1.4	0.6	0.5	1.8	31.0	1660
40 x 1.4	0.6	0.5	1.8	33.4	1960
50 x 1.4	0.6	0.8	2.2	39.8	2790
60 x 1.4	0.6	0.8	2.2	41.3	3050

1-Copper Conductor 2-Polyethylene Insulation 3-Bedding

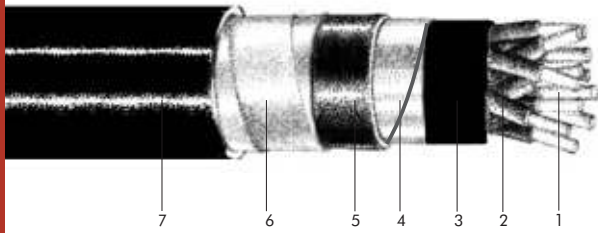
4-Copper Tape Screen 5-Bedding 6-Double Galvanized Steel Tape Armour 7-PVC Overall Sheath

Also available for 2,4,6 core.

Electrical Data

Electrical properties:	Unit	Values
Max. conductor DC resistance	ohm/km	11.9
Min. insulation resistance	Mohm.km	5000
Max. Mutual capacitance	nF/km	120
Test voltage	V	2500
Operating voltage	V	600





VDE0816-2 Cu/PE/Bd/CTS/Bd/STA/PVC

Description:

Tape armoured signalling cable with copper conductor and PE insulation.

Number of Cores & Cross Section mm	Insulation Thickness mm	Armour Diameter mm	Sheath Thickness mm	Cable Diameter mm	Total Weight kg/km
3 x 4 x 1.4	0.7	0.5	1.8	26.3	1050
5 x 4 x 1.4	0.7	0.5	1.8	30.3	1420
7 x 4 x 1.4	0.7	0.5	1.8	33.3	1740
8 x 4 x 1.4	0.7	0.5	2.2	36.2	1970
10 x 4 x 1.4	0.7	0.8	2.2	41.3	2690

1-Copper Conductor 2-Polyethylene Insulation 3-Bedding

4-Copper Tape Screen 5-Bedding 6-Double Galvanized Steel Tape Armour 7-PVC Overall Sheath

Also available with single quad cable.

Electrical Data

Electrical properties:	Unit	Values
Max. conductor DC resistance	ohm/km	11.9
Min. insulation resistance	Mohm.km	5000
Max. Mutual capacitance	nF/km	50
Test voltage	V	2500
Operating voltage	V	600

TECHNICAL DATA



IEC & AWC Abbreviations

Cu	Copper
Al	Aluminium
AA	Aluminium Alloy
TiCu	Tinned Copper
SiCu	Silver Coated copper
RM	Stranded Circular
SM	Shaped Stranded
SE	Shaped Solid
RE	Solid Circular
RF	Flexible Circular
RMS	Stranded Segmental (Milliken)
CTS	Copper Tape Screen
CWS	Copper Wire Screen
CuB	Copper Wire Braided Screen
ICTS	Individual Copper Tape Screen
ICWS	Individual Copper Wire Screen
ISCR	Individual Screen Formed by Polyester + Tinned Drain Wire + Aluminium Backed Polyester + Polyester
ISCRC	Individual Screen Formed by Polyester + Tinned Drain Wire + Copper Backed Polyester + Polyester
OSCR	Overall Screen Formed by Polyester + Tinned Drain Wire + Aluminium Backed Polyester
OSCRC	Overall Screen Formed by Polyester + Tinned Drain Wire + Copper Backed Polyester
TCB	Tinned Copper Wire Braided Screen
CW	Communication Wire
ATA	Double Aluminium Tape Armour
STA	Double Galv. Steel Tape Armour
AWA	Aluminium Wire Armour
AWAT	Aluminium Wire Armour + Counter Helix
SWA	Galv. Steel Wire Armour
SWAT	Galv. Steel Wire Armour + Counter Helix
SSWA	Stainless Steel Wire Armour
DAWA	Double Aluminum Wire Armour
DSWA	Double Galv. Steel Wire Armour
TCWA	Tinned Copper Wire Armour
AWB	Aluminium Wire Braided
SWB	Galv. Steel Wire Braided
BWB	Bronze Wire Braided
SSWB	Stainless Steel Wire Braided
LSh	Lead Sheath
AIPE	Aluminium Copolymer Coated

Bd	Bedding
BT	Brass tape
BHT	Bituminized Hessian Tape
BPT	Bitumen Coated Paper Tape
BdT	Bedding Tape (PVC or PE)
BrT	Bronze Tape
MGT	Mica Glass Tape
PPT	Polypropylene Tape
SCT	Semi Conductive Tape
WBT	Water Blocking Tape
Pet	Polyester Tape (Mylar)
SCWBT	Semi-Conductive Water Blocking Tape
PPY	Polypropylene Yarn
WBY	Water Blocking Yarn
SCYF	Semi-conductive Yarn Filler
GC	Graphite Coating
GFB	Glass Fiber Braided
FPE	Foamed Polyethylene (Cellular)
TPU	Thermoplastic Polyurethane
SC	Ext. Polymer Semi Conductive
TPE	Thermoplastic Elastomer
PVC	Polyvinylchloride
XLPE	Cross Linked Polyethylene
SIR	Silicone Rubber
PE	Polyethylene
EVA	Ethylene Vinyl Acetate
XEVA	Cross Linked EVA
HDPE	High Density Polyethylene
HEPR	Hard Grade Ethylene Propylene Rubber
LDPE	Low Density Polyethylene
MDPE	Medium Density Polyethylene
LSFOH	Low Smoke Flame Retardant Zero Halogen
EPR	Ethylene Propylene Rubber
PVCE	High Temperature PVC (90°C)
PVCH	High temperature Sheathing Compound equal to IEC ST2 ,VDE YM5 (90°C)
APVC	Anti Termite PVC
APVCE	Anti Termite High Temperature PVC (90°C)
APVCH	Anti Termite & High Temperature Sheathing Compound equal to IEC ST2 ,VDE YM5 (90°C)
XPVC	Cross Linked PVC
OPVC	Oil, Acid & Hydrocarbon Resistance Sheathing Compound
OPVCH	Oil Resistant & High Temperature Sheathing Compound equal to IEC ST2 ,VDE YM5 (90°C)



FORMULAS

1- Inductance

$$L = K + 0.2Ln(2D/d) \quad (mH/km)$$

K : Constant relating to conductor structure
 D : Axial cable spacing (mm)
 d : Conductor diameter (mm)

K	Strands
0	1
0.078	3
0.0642	7
0.0554	19
0.0528	37
0.0514	61 & over

2- Maximum Pulling Tension

Unarmoured :

$$T = K S \quad (N) \quad \begin{array}{l} K = 50 \text{ for copper} \\ K = 30 \text{ for aluminium} \end{array}$$

Armoured :

$$T = K'D^2 \quad (N) \quad \begin{array}{l} K' = 9 \text{ for wire armour} \\ K' = 3 \text{ for tape armour, lead sheath} \end{array}$$

S : Conductor cross section (mm²)
 D : Cable diameter (mm)

FORMULAS

3-Capacitance

2 conductors:
$$C_m = \frac{12.10\epsilon}{\log\left(\frac{D_m}{kd_m} + \sqrt{\left(\frac{D_m}{kd_m}\right)^2 - 1}\right)}$$

Twisted Pair in Air:
$$C_m = \frac{7.25\epsilon}{\log\frac{1.3D_m}{kd_m}}$$

Shielded Twisted Pair:
$$C_m = \frac{12.10\epsilon}{\log\frac{1.2D_m}{kd_m}}$$

Cabled Twisted Pair
$$C_m = \frac{9.61\epsilon}{\log\frac{1.5D_m}{kdm}}$$

4-Characteristic Impedance

$$Z_o = \frac{3334.5\sqrt{\epsilon}}{C_m}$$

ϵ = dielectric constant

D_m = insulated diameter (mm)

d_m = conductor diameter (mm)

k = stranding factor:

1.000 For 1 strand
0.939 For 7 strands
0.970 For 19 strands
0.980 For 37 strands

Z_o = characteristic impedance (Ω)

C_m = capacitance in (pF/m or nF/Km)

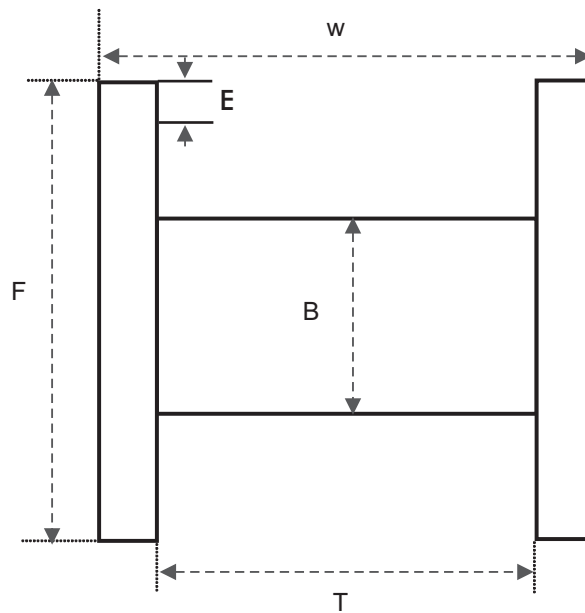


Max Cable length in meters on standard drums

Drum Sizes													
Cable Dia.mm	6	8	10	12	14	16	18	20	22	24	26	30	Cable Dia.mm
6	1326	3961											6
7	975	2910											7
8	746	2228	4391										8
9	590	1760	3470										9
10	478	1426	2810	4566									10
11	395	1178	2323	3774									11
12	332	990	1952	3171	4912								12
13	283	844	1663	2702	4185								13
14		727	1434	2330	3609	4934							14
15		634	1249	2029	3144	4298							15
16		557	1098	1784	2763	3777							16
17		493	972	1580	2448	3346	4858						17
18		440	867	1409	2183	2985	4333	4643					18
19		395	778	1265	1959	2679	3889	4167	4722				19
20		356	703	1142	1768	2417	3510	3760	4262				20
21		323	637	1035	1604	2193	3183	3411	3866				21
22		295	581	943	1461	1998	2901	3108	3522	4815			22
23		270	531	863	1337	1828	2654	2843	3223	4406			23
24			488	793	1228	1679	2437	2611	2960	4046			24
25			450	731	1132	1547	2246	2407	2728	3729			25
26			416	675	1046	1430	2077	2225	2522	3448			26
27			386	626	970	1326	1926	2063	2338	3197			27
28			358	582	902	1233	1791	1919	2174	2973			28
29			334	543	841	1150	1669	1789	2027	2771	4826		29
30			312	507	786	1074	1560	1671	1894	2590	4510		30
31			292	475	736	1006	1461	1565	1774	2425	4224		31
32			274	446	691	944	1371	1469	1665	2276	3964		32
33			258	419	650	888	1289	1381	1565	2140	3727	4999	33
34				395	612	836	1214	1301	1475	2016	3511	4709	34
35				373	577	789	1146	1228	1392	1903	3313	4444	35
36				352	546	746	1083	1161	1315	1798	3132	4200	36
37				334	517	706	1026	1099	1245	1702	2965	3976	37
38				316	490	670	972	1042	1181	1614	2811	3770	38
39				300	465	636	923	989	1121	1532	2669	3579	39
40				285	442	604	877	940	1065	1457	2537	3402	40
41				272	421	575	835	895	1014	1386	2415	3238	41
42				259	401	548	796	853	966	1321	2301	3086	42
43					383	523	759	814	922	1260	2195	2944	43
44					365	499	725	777	881	1204	2097	2812	44
45					349	478	693	743	842	1151	2004	2688	45
46					334	457	663	711	806	1101	1918	2573	46
47					320	438	636	681	772	1055	1837	2464	47
48					307	420	609	653	740	1012	1762	2363	48
49					295	403	585	626	710	971	1691	2267	49
50					283	387	562	602	682	932	1624	2178	50
51					272	372	540	578	655	896	1561	2093	51
52					262	358	519	556	630	862	1501	2013	52
53					252	344	500	535	607	830	1445	1938	53
54						332	481	516	585	799	1392	1867	54
55						320	464	497	564	770	1342	1800	55
56						308	448	480	544	743	1294	1736	56
57						298	432	463	525	717	1249	1676	57
58						287	417	447	507	693	1207	1618	58
59						278	403	432	490	670	1166	1564	59
60						269	390	418	474	647	1127	1512	60
61						260	377	404	458	626	1091	1463	61
62						252	365	391	443	606	1056	1416	62
63							354	379	430	587	1023	1372	63
64							343	367	416	569	991	1329	64
65							332	356	403	552	961	1288	65
66							322	345	391	535	932	1250	66
67							313	335	380	519	904	1213	67
68							304	325	369	504	878	1177	68
69							295	316	358	490	853	1143	69
70							287	307	348	476	828	1111	70
71							278	298	338	462	805	1080	71
72							271	290	329	450	783	1050	72
73							263	282	320	437	762	1022	73
74							256	275	311	426	741	994	74
75							250	267	303	414	722	968	75
76								260	295	403	703	942	76
77								254	288	393	685	918	77
78									280	383	667	895	78
79									273	373	650	872	79
80									266	364	634	851	80
81									260	355	619	830	81
82									254	347	604	810	82
83										338	589	790	83
84										330	575	772	84
85										323	562	753	85
86										315	549	736	86
87										308	536	719	87
88										301	524	703	88
89										294	512	687	89
90										288	501	672	90
91										281	490	657	91
92										275	480	643	92
93										269	469	629	93
94										264	459	616	94
95										258	450	603	95
96										253	440	591	96
97											431	579	97
98											423	567	98
99											414	555	99
100											406	544	100



Drum size	Flange Dia. F	Barrel Dia. B	Traverse T	Width overall W	Drum weight Kg
6	600	300	400	430	20
8	800	350	520	600	30
10	1000	450	620	700	50
12	1200	600	720	820	70
14	1400	700	790	920	125
16	1600	900	900	1028	175
18	1800	1100	1120	1248	290
20	2000	1200	1120	1248	330
22	2200	1400	1120	1248	450
24	2400	1600	1370	1570	595
26	2600	1600	1700	1900	645
30	3000	2000	1900	2100	770



$$L_T = \frac{\pi NP (B + PD)}{1000}$$

$$P = \frac{F - B - 2E}{2D}$$

$$N = 0.95 \frac{T}{D}$$

L_T = Length of Cable (m)

F = Flange Dia. (mm)

B = Barrel Dia. (mm)

D = Cable Dia. (mm)

T = Traverse (mm)

E = Empty Space (mm)

