

TELECOM COPPER CABLES



SUBSCRIBER NETWORK

Drop cable

- PE insulation, Aerial installation
TE1SE

Indoor cables

- PVC insulation, PVC sheath
TVHV · TVV
- PE insulation, PVC or LSHF sheath
TEV · TEZ1
- PVC insulation, Al screen, PVC sheath
SYT1 0,6/0,9

LOCAL NETWORK

Pair cables

- PE insulation, Al screen, PE or LSHF sheath
TE1HE · TE1HZ1 · TE1HE2AE · TE1HES
- PE insulation, Jelly filled
T1EG1HE · T1EG1HEAE

Quad cables

- PE insulation, Al screen, PE sheath
TE1HE · TE1HEAV · TE1HEAE
- Smart grid, PVC insulation, Al screen, PVC sheath
Téléreport Armé · Téléreport Non Armé

TELECOM COPPER CABLES

APPLICATION

Circular shape cables with 1 or 2 pairs, with transmission characteristics similar to category 3. For aerial installation in the subscribers network (tensile strength > 1350 N).

CABLE DESIGNATION

TE1SE

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,5 or 0,8 mm.

Insulation

Solid polyethylene.

Arrangement (formation)

Pairs.

Mechanical reinforcement

Aramid yarns applied parallel to the cable core.

Oversheath (jacket)

Black, low density polyethylene (PE).

COLOUR AND CABLE MARKING

Black.

Sheath (jacket) will be marked, at regular intervals, with the following information:
<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

N.º Pair	Conductor "a"	Conductor "b"
1	White	Blue
2	Yellow	Black

GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

	Ø 0,5 mm	Ø 0,8 mm
Maximum Ohmic resistance at 20°C dc(Ω/km)	95	37
Resistance unbalance	Maximum individual value: 2%	
Minimum insulation resistance at 20°C, 500Vdc	10 000 MΩ x km	
Dielectric strength	Cond-Cond – 1kV _{dc} (60s) or 2kV _{dc} (3s)	
Mutual capacitance at 1 kHz	Maximum value: 55 nF/Km	
Maximum capacitance unbalance (pair-pair) (pF/km)(*)	300	

(*) – Only applies to cables with 2 pairs



Frequency (Hz)	Attenuation (dB/km)		Characteristic Impedance (Zc) (Ohm)	Return Loss (RL) (dB)	NEXT (*) (dB)	FEXT (*) (dB)
	Ø 0,5mm	Ø 0,8mm				
800	< 1,5	< 1,0	600 ± 50	Nd	Nd	Nd
64k	< 8,0	< 5,0	125 ± 25	Nd	Nd	Nd
256k	< 11,0	< 7,6	Nd	Nd	Nd	Nd
512k	< 15,5	< 11,0	Nd	Nd	Nd	Nd
772k	< 18,0	< 13,0	100 ± 15	> 18	> 64	>64
1M	< 21,0	< 15,0	100 ± 15	> 18	> 62	>62
4M	< 43,0	< 30,0	100 ± 15	> 18	> 53	>53
10M	< 66,0	< 47,0	100 ± 15	> 15	> 47	>47
16M	< 82,0	< 62,0	100 ± 15	> 15	> 44	>44

(*) – Only applies to cables with 2 pairs • Nd – not defined

DIMENSIONAL CHARACTERISTICS

N.º of pairs	Ø 0,5 mm		Ø 0,8 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
1	5,5	23	5,5	27
2	5,5	25	8,0	55

TELECOM COPPER CABLES

APPLICATION

Cables ranging from 1 to 200 pairs, used for inside installations.

CABLE DESIGNATION

TVHV

TVV (without metallic screen)

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,5 mm.

Insulation

PVC.

Arrangement (formation)

Pairs (the two pair cable has the arrangement (formation) of a star-quad).

Core assembly

Units of 10 or 50 pairs.

Core wrapping

Dielectric tape, helically applied with an overlap.

Metallic screen (only for TVHV)

One aluminium/ polyester (9µm /12,5µm) tape spirally applied, with an overlap. Under the metallic screen a tinned copper wire with nominal diameter of 0,5mm, is longitudinally applied.

Oversheath (jacket)

PVC.

COLOUR AND CABLE MARKING

Grey.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

N.º Pair	Conductor "a"	Conductor "b"	N.º Pair	Conductor "a"	Conductor "b"
1	White	Blue	6	Red	Blue
2	White	Orange	7	Red	Orange
3	White	Green	8	Red	Green
4	White	Brown	9	Red	Brown
5	White	Grey	10	Red	Grey

For cables with triads, each triad has a black third conductor.



GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

Maximum Ohmic resistance at 20°C dc(Ω /km)	95,9
Minimum insulation resistance at 20°C, 500Vdc	500 M Ω x km
Dielectric strength (60s)	Cond-Cond – 1kVdc or 1,5kVac
Mutual capacitance at 0,8kHz (maximum value)	
N.º pairs in the cable \leq 6	132 nF/Km
N.º pairs in the cable $>$ 6	120 nF/Km
Maximum capacitance unbalance (pair-pair) (pF/500)	400

DIMENSIONAL CHARACTERISTICS

Pairs · PVC insulation · Al screen · PVC sheath – TVHV

N.º of pairs/triads	\emptyset 0,5 mm	
	Diameter (mm)	Weight (kg/km)
1x2	3,7	20
1x3	4,1	24
2x2	4,1	26
3x2	5,1	36
6x2	6,1	54
10x2	7,2	77
10x3	9,4	110
15x2	8,0	105
20x2	9,3	140
20x3	12,5	210
30x2	11,5	195
40x2	12,3	245
50x2	13,5	300
60x2	14,5	350
100x2	18,3	555
200x2	25,6	1 100

TELECOM COPPER CABLES

APPLICATION

Cables of 1, 2 and 3 pairs used as a connection from inside building up to subscribers' houses.

CABLE DESIGNATION

TEV

TEZ1 (with LSHF sheath)

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,5 mm or 0,6 mm.

Insulation

Solid polyethylene.

Arrangement (Formation)

Pairs (optionally, the two pair cable may have the arrangement (formation) of a star-quad).

Oversheath (jacket)

Extruded PVC or LSHF – Low Smoke Halogen Free thermoplastic compound.

COLOUR AND CABLE MARKING

Ivory.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

N.º Pair	Conductor "a"	Conductor "b"
1	Brown	White
2	Red	Green
3	Blue	Yellow

GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

	Ø 0,5 mm		Ø 0,6 mm			
Maximum Ohmic resistance at 20°C dc(Ω/km)	93		66			
Resistance unbalance	Maximum individual value: 2%					
Minimum insulation resistance at 15°C, 500Vdc	8 000 MΩ x km					
Dielectric strength	Cond-Cond – 3kVdc (3s)					
Mutual capacitance at 1 kHz	Maximum value: 56 nF/Km					
Capacitance unbalance (pair-pair) (pF/225m), 800Hz	Maximum value: 510					
Nominal attenuation (dB /Km)		0,8 kHz	1,5 kHz	3 kHz	40 kHz	96 kHz
	Ø 0,5 mm	1,7	1,8	2,3	9,0	24,5
	Ø 0,6 mm	1,2	1,6	2,0	6,0	19,0

DIMENSIONAL CHARACTERISTICS

Pairs · PE insulation · PVC Sheath – TEV

N.º of pairs	Ø 0,5 mm		Ø 0,8 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
1	3,7	17	4,0	20
2	5,0	27	5,9	33
3	5,8	33	6,5	42

TELECOM COPPER CABLES

APPLICATION

Cables ranging from 1 to 112 pairs, used for inside installations.

CABLE DESIGNATION

SYT1

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,6 mm or 0,9 mm.

Insulation

PVC.

Arrangement (Formation)

Pairs.

Core assembly

Concentric layers or bundles for cables with 56 pairs (4x14) or 112 pairs (8x14).

Core wrapping

Dielectric tape, helically applied with an overlap.

Metallic screen

One aluminium/ polyester (9µm /12,5µm) tape spirally applied, with an overlap. Under the metallic screen a tinned copper wire with nominal diameter of 0,5mm, is longitudinally applied.

Oversheath (jacket)

PVC.

COLOUR AND CABLE MARKING

Grey.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

For cables with pairs in concentric layers, the pairs are identified according to the following table:

Conductor "a"	Conductor "b"						
	White	Blue	Yellow	Brown	Black	Red	Green
Light-Blue	1	2	3	4	5	6	7
Grey	8	9	10	11	12	13	14
Orange	15	16	17	18	19	20	21
Purple	22	23	24	25	26	27	28
Light-Blue	29	30	31	32	33	34	35
Grey	36	37	38	39	40	41	42

For cables assembled in bundles, each bundle will have a winding tape with the following successively colours:
White • blue • yellow • brown • black • red • green • purple.



GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

	Ø 0,6 mm	Ø 0,9 mm
Maximum Ohmic resistance at 20°C dc(Ω/km)	133,4	59,3
Minimum insulation resistance at 20°C, 500Vdc	500 MΩ x km	
Dielectric strength (60s)	Cond-Cond – 1,5kVdc	
Mutual capacitance at 0,8kHz (maximum value)		
N.º pairs in the cable < 10	160 nF/Km	
N.º pairs in the cable ≥ 10	130 nF/Km	
Maximum capacitance unbalance (pair-pair) (pF/500)	400	

DIMENSIONAL CHARACTERISTICS

Pairs • PVC insulation • Al screen • PVC sheath – SYT1

N.º of pairs	Ø 0,6 mm		Ø 0,9 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
1	4,2	26	5,2	40
2	5,5	40	7,6	75
3	5,7	50	7,9	90
5	7,0	75	9,2	130
7	7,6	90	10,5	170
10	8,6	115	12,0	225
15	9,6	155	13,5	310
21	11,3	210	15,5	410
30	13,0	280	18,4	580
56	16,6	480	24,5	1 020
112	23,1	910	34,0	1 980

TELECOM COPPER CABLES

APPLICATION

Cables ranging from 6 to 2 424 pairs, for distribution to subscribers or connecting multiline telephone systems. Suitable for underground or duct installation. Can be used for aerial installation with a suspension strand.

CABLE DESIGNATION

TE1HE · TE1HZ1 (PE or LSHF sheath)

TE1HE2AE (corrugated armoured cable)

TE1HES (figure 8 cables, for aerial installation)

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,40; 0,51; 0,64 and 0,91 mm.

Insulation

Solid polyethylene.

Arrangement (formation)

Pairs.

Core assembly

Units of 12, 13, 25, 50 and 100 pairs.

Core wrapping

Dielectric tape, helically applied with an overlap.

Shield (screen)

Aluminium tape with copolymer on both sides, applied longitudinally with an overlap.

Inner sheath (jacket)

Armoured cables shall have a black, low density polyethylene (PE).
or fire proof material (halogen free) sheath.

Armour

Armoured cables shall have a corrugated steel tape applied longitudinally with an overlap.

Oversheath (jacket)

Low density polyethylene (PE) or LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant.

Steel strength member (fig.8 cables)

Cables for aerial installation shall have a galvanized steel wires strand.

COLOUR AND CABLE MARKING

Black.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>



COLOUR CODE

N.º Pair	Conductor "a"	Conductor "b"	N.º Pair	Conductor "a"	Conductor "b"
1	White	Blue	14	Black	Brown
2	White	Orange	15	Black	Grey
3	White	Green	16	Yellow	Blue
4	White	Brown	17	Yellow	Orange
5	White	Grey	18	Yellow	Green
6	Red	Blue	19	Yellow	Brown
7	Red	Orange	20	Yellow	Grey
8	Red	Green	21	Violet	Blue
9	Red	Brown	22	Violet	Orange
10	Red	Grey	23	Violet	Green
11	Black	Blue	24	Violet	Brown
12	Black	Orange	25	Violet	Grey
13	Black	Green	26	White	Black

GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cables ≤ 2,5 m)
Halogen free	
Low smoke	IEC 61034-2 · EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 · EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 · EN 50267-2-3 (LSFH sheath: pH ≥ 4,3 · conductivity ≤ 10µS/mm)

		Ø 0,40 mm	Ø 0,51 mm	Ø 0,64 mm	Ø 0,91 mm
Maximum Ohmic resistance at 20°C dc(Ω/km)		144,2	89,5	56,6	28,5
Dielectric strength (Vdc, 3s)	Cond-Cond	2 500	3 000	3 600	4 500
	Cond-Screen	5 000	5 000	10 000	10 000
Far-end crosstalk (ELFEXT) (dB/km, 1MHz)	Min	57	57	57	57
	Average Min	35	35	37	37
Nominal attenuation (dB/km)	0,8 kHz	1,64	1,30	1,04	0,74
	3 kHz	3,18	2,52	2,01	1,42
	150 kHz	11,40	8,30	6,20	4,40
	1 MHz	27,10	21,40	17,50	12,80
Near-end crosstalk (NEXT) (dB, 500 m, 1MHz)		N.º pairs ≤ 51		N.º pairs > 51	
	(Average-σ)	>50		>55	
	Minimum	40		45	
Resistance unbalance		Average: max. value: 1,5%			
		Maximum individual value: 5%			

TELECOM COPPER CABLES

Minimum insulation resistance at 15°C, 500Vdc

20 000 MΩ x km

Mutual capacitance at 1 kHz

Average value: 52 ± 3 nF/Km

Maximum value: 58 nF/Km

	Rms. max	Average max.	Max. value
Capacitance unbalance (pF/km, 800Hz)			
Pair-pair (<12p)	—	—	145
Pair-pair (>12p)	45	—	—
Pair-ground (<12p)	—	—	2 625
Pair-ground (>12p)	—	574	2 625

DIMENSIONAL CHARACTERISTICS

Outdoor cable · Pairs · PE insulation · Al screen · PE · Dry core – TE1HE

N.º of Pairs	Ø 0,40 mm		Ø 0,51 mm		Ø 0,64 mm		Ø 0,91 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
6	7,8	60	8,6	80	9,8	100	11,9	160
11	8,9	90	10,0	110	11,5	150	14,3	250
16	9,7	100	11,0	140	12,8	200	16,1	330
21	10,5	130	12,0	170	14,0	240	17,8	410
26	11,2	140	12,9	200	15,1	290	19,3	490
31	11,8	160	13,7	230	16,1	330	20,9	580
51	13,9	230	16,7	350	19,8	510	25,6	900
76	16,4	330	19,8	490	23,7	740	31,3	1 330
101	18,2	420	22,2	630	26,6	950	35,4	1 740
152	21,7	600	26,1	900	31,6	1 370	42,3	2 540
202	24,4	770	30,1	1 160	36,6	1 790	49,4	3 350
303	28,8	1 100	35,8	1 690	43,7	2 600	59,5	4 930
404	32,6	1 430	40,6	2 200	50,1	3 430	68,0	6 500
606	39,0	2 090	49,0	3 240	60,4	5 070	82,0	9 600
909	47,2	3 100	59,0	4 790	73,0	7 540		
1 212	53,7	4 060	67,5	6 310	83,2	9 900		
1 515	59,2	5 000	74,8	7 810				
1 818	64,6	5 980	81,2	9 290				
2 121	69,2	6 910						
2 222	70,7	7 220						
2 424	73,9	7 890						

Indoor cable · Pairs · PE insulation · Al screen · LSHF sheath · Dry core – TE1HZ1

N.º of Pairs	Ø 0,40 mm		Ø 0,51 mm		Ø 0,64 mm		Ø 0,91 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
6	7,8	80	8,6	100	9,8	130	11,9	190
11	8,9	110	10,0	140	11,5	180	14,3	280
16	9,7	130	11,0	170	12,8	230	16,1	370
21	10,5	150	12,0	200	14,0	270	17,8	460
26	11,2	170	12,9	230	15,1	320	19,3	540
31	11,8	190	13,7	260	16,1	370	20,9	640
51	13,9	270	16,7	390	19,8	570	25,6	970
76	16,4	370	19,8	550	23,7	820	31,3	1 450
101	18,2	470	22,2	700	26,6	1 040	35,4	1 880
152	21,7	670	26,1	990	31,6	1 490	42,3	2 710
202	24,4	860	30,1	1 270	36,6	1 930	49,4	3 570
303	28,8	1 200	35,8	1 820	43,7	2 780	59,5	5 210
404	32,6	1 550	40,6	2 360	50,1	3 660	68,0	6 850
606	39,0	2 240	49,0	3 460	60,4	5 360	82,0	10 050
909	47,2	3 310	59,0	5 080	73,0	7 940		
1 212	53,7	4 310	67,5	6 670	83,2	10 350		
1 515	59,2	5 280	74,8	8 220				
1 818	64,6	6 300	81,2	9 730				
2 121	69,2	7 260						
2 222	70,7	7 580						
2 424	73,9	8 290						

TELECOM COPPER CABLES

Outdoor cable · Pairs · PE insulation · Al screen · PE · Corrugated armour · PE – TE1HE2AE

N.º of Pairs	Ø 0,40 mm		Ø 0,51 mm		Ø 0,64 mm		Ø 0,91 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
6	12,4	160	12,4	180	14,4	210	16,4	290
11	13,4	190	14,4	220	15,4	270	18,5	390
16	14,4	210	15,4	260	17,5	330	21,0	490
21	14,4	240	16,4	300	18,5	380	22,8	600
26	15,4	260	17,5	330	19,5	440	24,2	690
31	16,4	290	17,5	360	21,2	490	26,0	800
51	18,5	380	21,0	500	24,2	700	30,6	1 160
76	21,0	490	24,2	680	28,9	970	36,9	1 650
101	22,6	600	27,3	850	32,1	1 220	42,2	2 120
152	25,8	810	30,6	1 160	36,9	1 690	49,2	3 010
202	28,9	1 010	35,1	1 460	42,2	2 170	55,7	3 900
303	33,6	1 390	42,0	2 050	49,2	3 070	66,9	5 640
404	37,6	1 770	46,2	2 630	57,2	4 000	76,3	7 330
606	46,0	2 510	55,7	3 790	68,5	5 800	90,2	10 620
909	54,0	3 620	66,7	5 490	80,9	8 430		
1 212	60,5	4 670	74,8	7 130	91,8	10 930		
1 515	66,9	5 740	82,4	8 720				
1 818	71,7	6 760	88,7	10 280				
2 121	77,8	7 790						
2 222	77,8	8 100						
2 424	82,4	8 790						

Outdoor cable · Pairs · PE insulation · Al screen · PE · Aerial installation – TE1HES

N.º of Pairs	Ø 0,40 mm		Ø 0,51 mm		Ø 0,64 mm		Ø 0,91 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
6	7,6	210	8,4	230	9,6	250	11,7	310
11	8,7	230	9,8	260	11,3	300	14,1	390
16	9,5	250	10,8	290	12,6	340	15,9	470
21	10,3	270	11,8	320	13,8	390	17,6	650
26	11,0	290	12,7	340	14,9	430	19,1	730
31	11,6	310	13,5	370	15,9	470	21,1	830
51	13,7	380	16,1	480	19,2	640	25,8	1 150
76	15,8	460	18,8	610	23,1	960	30,5	1 540
101	17,6	550	21,6	860	26,0	1 170	34,4	1 930
152	21,3	830	25,5	1 120	30,8	1 580		
202	23,8	1 000	29,3	1 380				
303	28,2	1 320						

Steel messenger type	Minimum breaking load (daN)	Nº of Pairs			
		Ø 0,40 mm	Ø 0,51 mm	Ø 0,64 mm	Ø 0,91 mm
7x1,6 mm	1 570	≤ 101	≤ 76	≤ 51	≤ 16
7x2,1 mm	2 600	> 101	> 76	> 51	> 16

TELECOM COPPER CABLES

APPLICATION

Cables ranging from 10 to 2400 pairs, for distribution to subscribers or connecting multiline telephone systems. Suitable for underground or duct installation.

CABLE DESIGNATION

T1EG1HE

T1EG1HEAE (armoured cable)

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,4; 0,5; 0,6 and 0,9 mm.

Insulation

Cellular (foam-skin) polyethylene.

Arrangement (formation)

Pairs.

Core assembly

Units of 10, 50 and 100 pairs.

Filling compound

Waterblocking compound, compatible with all the remaining cable components.

Core wrapping

Dielectric tape, helically applied with an overlap.

Shield (screen)

Aluminium tape with copolymer on one side, applied longitudinally with an overlap.

Inner sheath (jacket)

Armoured cables shall have a black, low density polyethylene (PE) sheath.

Armour

Armoured cables shall have a double steel tape armour, helically applied.

Oversheath (jacket)

Black, low density polyethylene (PE).

COLOUR AND CABLE MARKING

Black.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

N.º Pair	Conductor "a"	Conductor "b"	N.º Pair	Conductor "a"	Conductor "b"
1	White	Blue	6	Red	Blue
2	White	Orange	7	Red	Orange
3	White	Green	8	Red	Green
4	White	Brown	9	Red	Brown
5	White	Grey	10	Red	Grey



GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

	Ø 0,4 mm	Ø 0,5 mm	Ø 0,6 mm	Ø 0,9 mm	
Maximum Ohmic resistance at 20°C dc(Ω/km)	Maximum	150	95,9	66,6	29,0
	Average Max	144	92,1	63,9	27,8
Dielectric strength (Vdc, 3s)	Cond-Cond	1 000 / 500			
	Cond-Screen	2 000 / 1 000			
Resistance unbalance maximum (%)	2,5				
Minimum insulation resistance at 15°C, 500Vdc	10 000 MΩ x km				
Mutual capacitance at 1 kHz	(*) Average maximum: 55 nF/Km Maximum value: 64 nF/Km				
Capacitance unbalance max. (pF/km, 800Hz)	400				

(*) – only applied to cables with more than 20 pairs.

DIMENSIONAL CHARACTERISTICS

Outdoor cable · Pairs · PE foam-skin insulation · Al screen · PE · Jelly filled – T1EG1HE

N.º of Pairs	Ø 0,4 mm		Ø 0,5 mm		Ø 0,6 mm		Ø 0,9 mm	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
10	9	80	10	100	11	140	14	240
20	10	120	11	160	14	220	17	420
30	12	160	13	220	16	300	21	600
50	14	250	16	340	19	450	25	950
100	18	450	21	600	25	850	35	1 800
150	22	650	25	900	31	1 300	42	2 750
200	25	850	28	1 200	35	1 750	48	3 600
300	29	1 250	36	1 750	44	2 600	60	5 350
400	34	1 650	40	2 300	50	3 400		
600	40	2 400	49	3 400	60	5 000		
800	46	3 150	56	4 500	68	6 600		
900	49	3 500	58	5 000	72	7 400		
1 000	51	3 900	61	5 600	75	8 200		
1 200	56	4 650	67	6 600				
1 600	64	6 100	76	8 800				
1 800	68	6 900	79	9 800				
2 000	71	7 600						
2 400	78	9 100						

TELECOM COPPER CABLES

APPLICATION

Cables ranging from 1 to 52 quads, for distribution to subscribers or connecting multiline telephone systems. Suitable for underground or duct installation.

CABLE DESIGNATION

TE1HE

TE1HEAV · TE1HEAE (armoured cable)

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,6 or 0,9 mm.

Insulation

Solid polyethylene.

Arrangement (formation)

Star-quads.

Core assembly

In layers.

Core wrapping

Dielectric tape, helically applied with an overlap.

Shield (screen)

Aluminium tape with copolymer on one side, applied longitudinally with an overlap.

Inner sheath (jacket)

Armoured cables shall have a black, low density polyethylene (PE) sheath.

Armour

Armoured cables shall have a double steel tape armour, helically applied.

Oversheath (jacket)

Black, low density polyethylene (PE) or PVC (in option for armoured cables).

COLOUR AND CABLE MARKING

Black.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<Manufacturer's name> <type of cable> <year> <metric marking>

COLOUR CODE

Quad position in the centre or in the layer	Insulation colour				
	Cond. "a"	Cond. "b"	Cond. "c"	Cond. "d"	
1 st (pilot)	Yellow	White	Violet	Green	Grey
2 nd , 4 th , 6 th , etc.	Blue	White	Violet	Green	Grey
3 rd , 5 th , 7 th , etc	Red	White	Violet	Green	Grey
Last (reference)	Brown	White	Violet	Green	Grey



GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

		Ø 0,6 mm	Ø 0,9 mm
Maximum Ohmic resistance at 20°C dc(Ω/km)	Maximum	66,6	29,0
	Average Max	63,9	27,8
Dielectric strength (Vdc, 3s)	Cond-Cond (3s or 60s)	2 000 / 1 000	
	Cond-Screen (3s or 60s)	6 000 / 3 000	
Resistance unbalance maximum (%)		2,5	2,0
Mutual capacitance at 800Hz – average (nF/km)		42±5%	41±5%
Minimum insulation resistance at 15°C, 500Vdc		20 000 MΩ x km	
		Max. Average value	Max. value
Capacitance unbalance (pF/km, 800Hz)	Pair-pair:		
	Same quad	40	150
	Adjacent quads	40	170
	Pair-ground	150	600

DIMENSIONAL CHARACTERISTICS

Quads – PE insulation /Al screen /PE – TE1HE

N.º of Pairs	Ø 0,6 mm		Ø 0,9 mm	
	Diameter (kg/km)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
1	8	60	9	90
3	11	110	14	180
7	14	180	17	330
12	16	270	22	530
14	17	310	24	610
19	20	410	28	830
27	23	550	32	1 130
30	25	640	33	1 230
37	27	750	36	1 470
48	30	930	40	1 850
52	31	1 000	42	1 980

TELECOM COPPER CABLES

APPLICATION

Cable with one quad, used for inside installations and used to transmit the readings for consumed and delivered energy to a remote unit.

CABLE DESIGNATION

Cable Téléreport armé

Cable Téléreport non-armé

CONSTRUCTION CHARACTERISTICS

Conductor

Solid annealed copper, nominal diameter of 0,6 mm.

Insulation

PVC.

Arrangement (formation)

Star-quads.

Core wrapping

Dielectric tape, helically applied with an overlap.

Metallic screen

One aluminium/ polyester (9µm /12,5µm) tape spirally applied, with an overlap. Under the metallic screen a tinned copper wire with nominal diameter of 0,5 mm, is longitudinally applied.

Inner sheath (jacket)

The armoured cables shall have a PVC inner sheath, colour: ivory.

Armour

The armoured cables shall have a double steel tape armour, helically applied.

Oversheath (jacket)

The cables shall have an oversheath of PVC.

COLOUR AND CABLE MARKING

Unarmoured cables: Ivory. Armoured cables: Black.

Sheath (jacket) will be marked, at regular intervals, with the following information:

<type of cable><Manufacturer's name> <Manufacturer order> <Reference standard>

COLOUR CODE

N.º Quad	Conductor "a"	Conductor "b"	Conductor "c"	Conductor "d"
1	White	Blue	Red	Dark Blue



GENERAL AND ELECTRICAL CHARACTERISTICS (20°C)

Ohmic resistance at 20°C dc (Ω /km)	Minimum	120
	Maximum	133,2
Mutual capacitance at 50kHz (nF/km)	Minimum	80
	Maximum	130
Impedance characteristic at 50kHz (Ohm)	Minimum	75
	Maximum	115
Minimum insulation resistance at 20°C, 500Vdc		100 M Ω x km
Dielectric strength (Vac) (60s)	Cond-Cond	1 500
	Cond-Screen	1 500

DIMENSIONAL CHARACTERISTICS

(1) – Quad - PVC insulation • Al screen • PVC sheath – Cable Téléreport non-armé

(2) – Quad - PVC insulation • Al screen • PVC sheath • Armour • PVC sheath – Cable Téléreport armé

N.° of Quad	NON-ARMOURED (1)		ARMOURED (2)	
	Diameter (mm)	Weight (kg/km)	Diameter (mm)	Weight (kg/km)
1	5,3	40	10	140