IRCE Data Cables

International Standards

ISO/IEC 11801
IEC 61156-5
ANSI/TIA/EIA 568-A e B.2
EN 50173 - EN 50288

Basic abbreviations

Att. : Attenuation

NEXT : Near End Crosstalk

RL : Return Loss

UTP : Unshielded twisted pair

FTP: Foil shielded twisted pair

S-FTP : Foil and braid shielded twisted pair

S-STP : Individual foil shielded t.p. with braid

Buildings structured wiring systems

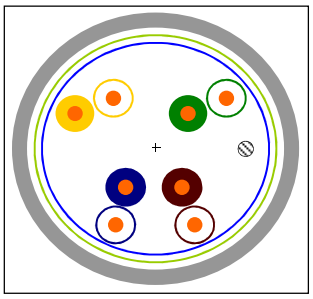
Inter-Building backbone cable (IB): when in a site there are two or several buildings a campus cable is used to connect and integrate the network within the overall area; this campus cable is usually an optical cable based upon 62.5/125mm Multimode fibre.

Raiser/Backbone cable (BC): network backbones and server connections inside a building;
the solution can be both a fiber optic cable or a system of screened twisted pair copper cables with high performance - Category 5e , 6 or 7 with data transmission rate from 100 to 1000 Mbps.

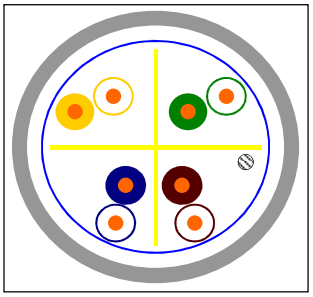
Horizontal cables (HO): when building system layout is defined, twisted pair cables provide the communication link between and inside specific work areas; 4 pair 24 AWG UTP and shielded FTP S-FTP for high speed networks operating at up to 100 Mbps, used in lengths of up to 90 meters.

Work Area cables (WA): high performance flexible patch cables are used for final linking from a wall connection to networked equipment; these cables are available unshielded or foil/braid shielded in size from 14 mm2 (26 AWG) to 22 mm2 (24AWG), are suitable for use up to 100 Mbps and meet the cross-talk (NEXT) requirements of Category 5 cables.

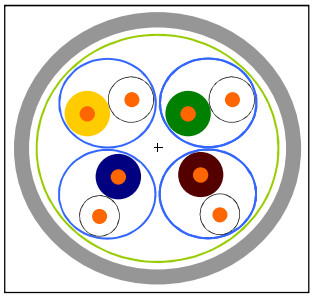
Category 5e



Category 6



Category 7



Copper Data Cable Class specifications and Category comparison

Cable type	Category 5°	Category 6	Category 7
Link class	D	E	F
Bandwidth	100 MHz	250 MHz	600 MHz
Standards	ISO/IEC 11801-1/2 ANSI/TIA/EIA 568-A-5	ISO/IEC 11801-2 ANSI/TIA/EIA 568-B	To be completely defined
Tipical applications	16 Mbps Token Ring 155 Mbps ATM 100 BASE-T 100Mbps TP PMD 1000 BASE-T	622 Mbps 1,2 Mbps ATM 1000 BASE-T	1,2 Mbps ATM 1000 BASE-T
Notes	Preferred over Category 5 wiring for new installation; addition to Category 5 requirements include Return Loss, NEXT (tightened by 3 dB) and PS NEXT & PS ELFEXT	Almost completely specified, supports Gigabit Ethernet requirements and other very high speed application reducing wiring costs.	

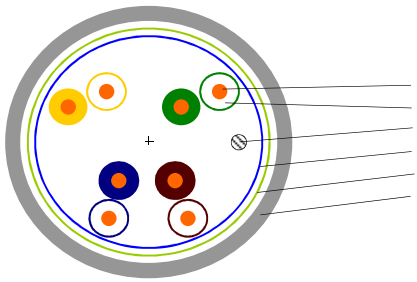
Data cables delivery program

Product type	Type of packaging	Meters	Meters per pallet
CAT 5e UTP & PATCH	Box (REELEX®)	305	6100
CAT 5e FTP, S-FTP	Box (REELEX®)	305	4880
CAT 5e all types	Drum 500 mm	1000	6000
CAT 5e UTP & PATCH	Drum 400 mm	500	9000
CAT 5e FTP SFTP	Drum 400 mm	500	6000
CAT 6 UTP & PATCH	Box (REELEX®)	305	6100
CAT 6 FTP	Drum 500 mm	500	3000
CAT 7 all types	Drum 500 mm	500	3000
CAT 7 all types	Drum 600 mm	1000	4000

Category 5e

Installation cable

Horizontal and Building Backbone cable Class D



1 - 24 AWG copper conductor
2 - Core isulation high density polythene
3 - Tinned copper drain wire (only FTP)
4 - Shield Al/PET tape (only FTP S-FTP)
5 - Tinned copper braid (only S-FTP)
6 - Overall sheath flame retardant PVC or LSOH

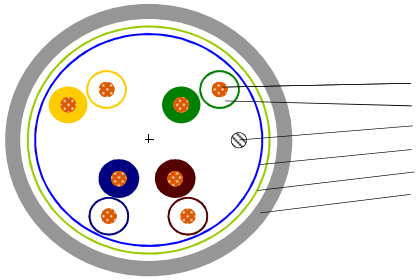
Electrical data:

	Standard			UTP			FTP			S-FTP		
	Att.	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**
1 MHz	2,1	65,3	20,0	2	74	28	2	73	26	2	72	26
4 MHz	4,1	56,3	23,0	3,9	64	29	4	63	27	4	62	27
10 MHz	6,5	50,3	25,0	6,2	57	29	6,3	58	27	6,3	56	27
16 MHz	8,2	47,2	25,0	7,8	54	29	7,9	53	27	7,9	52	27
20 MHz	9,3	45,8	25,0	8,8	52	30	8,9	50	28	8,9	51	28
32,25 MHz	11,7	42,9	21,5	11	50	30	11,2	48	28	11,2	47	28
62,50 MHz	17,0	38,4	21,5	16	46	30	16,2	44	28	16,2	43	28
100 MHz	22,0	35,3	20,1	20,7	42	30	20,9	40	28	20,9	39	28
125 MHz				22,5	40	30	22,6	37	28	22,6	36	28
155 MHz				25	38	29	25	35	27	25	34	27
200 MHz				28,5	36	28	28,5	33	26	28,5	32	26
250 MHz												
300 MHz												
600 MHz												

PSNEXT at 100 MHz -	dB	32,5	42	42	42
PSELFEXT at 100 MHz -	dB	21	28	28	28
Char. Impedance at 1-200 MHz -	Ω	100±15	100±15	100±15	100±15
DC loop-resistance -	Ω/Km	max 300	170	170	170
Resistance unbalance, max -	%	2	< 0,5	< 0,5	< 0,5
Capacitance unbalance, max -	pF/Km	1600	< 300	< 300	< 300
Capacitance - pF/m		max 55,8	48	52	50
Velocity of propagation		0,65	0,7	0,7	0,7
Mechanical data:					
Cu -	mm	0,4-0,6	0,515	0,515	0,515
Conductor -	mm	max 1,6	0,9	1	1,05
Screen -			-	Al/PET foil	Al/PET foil and braid
Outer diameter -	mm	max 20	5,3	6,2	6,4
Outer sheath color standard -			Grey, RAL 7035	Grey, RAL 7035	Grey, RAL 7035
Bending radius -	min	4xD	4xD	4xD	4xD
Temp. Range -	°C	-20° - +60°	-20° - +60°	-20° - +60°	-20° - +60°
Weight PVC / LSOH -	Kg/Km		33/32	40/39	48/47

Category 5e Patch Cable

Work area cable



1 - 26 or 24/7 AWG stranded copper conductor
2 - Core isulation high density polythene
3 - Stranded tinned copper drain wire (only FTP)
4 - Shield Al/PET tape (only FTP S-FTP)
5 - Tinned copper braid (only S-FTP)
6 - Overall sheath flame retardant PVC or LSOH

Electrical data:

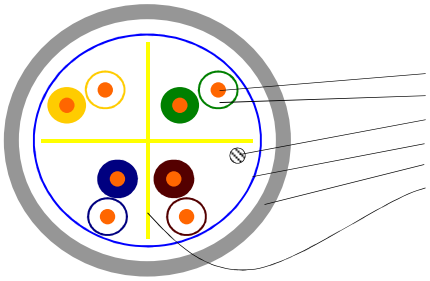
	Standard		UTP		FTP		S-FTP	
	Att.	**NEXT**	**Att.**	**NEXT**	**Att.**	**NEXT**	**Att.**	**NEXT**
1 MHz	3,2	62,3	2,5	74	2,7	73	2,7	73
4 MHz	6	56,3	5,6	64	5,8	63	5,8	63
10 MHz	9,5	50,3	9,1	57	9,3	58	9,3	58
16 MHz	12,1	47,2	11,7	54	11,2	53	11,2	53
20 MHz	13,6	45,8	13	52	13,2	50	13,2	50
32,25 MHz	17,1	42,9	16,5	50	16,8	48	16,8	48
62,50 MHz	24,8	38,4	24	46	24,5	44	24,5	44
100 MHz	32	35,3	31	42	31,6	40	31,6	40
125 MHz	36	33,8	32	40	32	37	32	37
155 MHz	40	32,4	34	38	34	35	34	35
200 MHz	47	30,7	36	37	36	37	36	37
250 MHz								
300 MHz								
600 MHz								

PSNEXT at 100 MHz - dB		40	38	38
PSELFEXT at 100 MHz - dB		27	26	26
Char. Impedance at 1-200 MHz - Ω	100±15	100±15	100±15	100±15
DC loop-resistance - Ω/Km	max 450	260	260	260
Resistance unbalance, max - %	2	< 0,5	< 0,5	< 0,5
Capacitance unbalance, max - pF/Km	1600	< 300	< 300	< 300
Capacitance - pF/m	max 55,8	47	50	52
Velocity of propagation	0,65	0,7	0,7	0,7
Mechanical data:				
Cu - mm		0,14 mm²	0,14 mm²	0,14 mm²
Conductor - mm		0,8	0,95	0,95
Screen -		-	Al/PET foil	Al/PET foil and braid
Outer diameter - mm		5,1	5,6	5,8
Outer sheath color standard -		Grey, RAL 7035	Grey, RAL 7035	Grey, RAL 7035
Bending radius - min		4xD	4xD	4xD
Temp. Range - °C		-20° - +60°	-20° - +60°	-20° - +60°
Weight PVC / LSOH - Kg/Km		30/30	36/35	42/41

Category 6

Installation cable

Horizontal and Building Backbone cable Class E



1 - 23 AWG copper conductor (24 AWG for FTP)
2 - Core isulation high density polythene
3 - Tinned copper drain wire (only FTP)
4 - Shield Al/PET tape (only FTP S-FTP)
5 - Overall sheath flame retardant PVC or LSOH
6 - Central spacer

Electrical data:

	Standard			UTP			FTP		
	Att.	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**
1 MHz	2,1	66	23	2	74	27	2	74	27
4 MHz	3,8	65,3	23	3,7	70	27	3,7	70	27
10 MHz	6	59,3	23	5,9	62	27	5,9	62	27
16 MHz	7,6	56,2	23	7,5	59	27	7,5	59	27
20 MHz	8,5	54,8	23	8,3	57	27	8,3	57	27
32,25 MHz	10,7	51,9	23	10,5	55	27	10,5	55	27
62,50 MHz	15,5	47,4	23	15,1	50	27	15,1	50	27
100 MHz	19,9	44,3	23	19,5	47	27	19,5	47	27
125 MHz	22,5	42,8	22	22	46	26	22	46	26
155 MHz	25,3	41,4	21,1	24,5	45	25	24,5	45	25
200 MHz	29,1	39,8	20	28	44	24	28	44	24
250 MHz	33	38,3	19	31	44	22	31	44	22
300 MHz									
600 MHz									

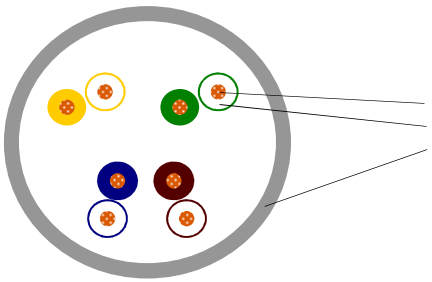
PSNEXT at 100 MHz -	dB			
PSELFEXT at 100 MHz -	dB			
Char. Impedance at 1-200 MHz -	Ω	100±15, ±18 f>100 MHz	100±15	100±15
DC loop-resistance -	Ω/Km	max 450	145	145
Resistance unbalance, max -	%	2	< 0,5	< 0,5
Capacitance unbalance, max -	pF/Km	1600	< 500	< 500
Capacitance - pF/m		-	48	52
Velocity of propagation		0,65	0,71	0,71

Mechanical data:

Cu -	mm	0,4-0,6	0,565	0,565
Conductor -	mm	max 1,6	1,1	1,2
Screen -			-	Al/PET foil
Outer diameter -	mm	max 20	6,8	7,4
Outer sheath color standard -			Grey, RAL 7035	Grey, RAL 7035
Bending radius -	min	4xD	4xD	4xD
Temp. Range -	°C	-20° - +60°	-20° - +60°	-20° - +60°
Weight PVC / LSOH -	Kg/Km		45/44	50/48

Category 6 Patch cable

Work area cable



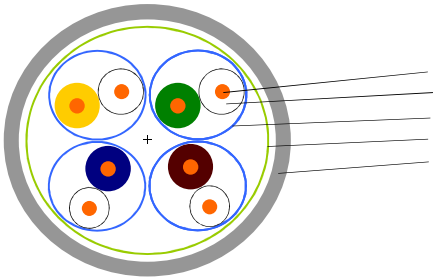
1 - 23 AWG stranded copper conductor (24 AWG for FTP)
2 - Core isulation high density polythene
3 - Overall sheath flame retardant PVC or LSOH

Electrical data:		**Standard**		**UTP**	
		Att.	**NEXT**	**Att.**	**NEXT**
1 MHz		3,1	66	3,1	72
4 MHz		5,8	65,3	5,7	68
10 MHz		9	59,3	8,9	60
16 MHz		11,4	56,2	11,3	57
20 MHz		12,8	54,8	12,7	56
32,25 MHz		16,1	51,9	16	54
62,50 MHz		23,2	47,4	23	49
100 MHz		29,9	44,3	29,7	46
125 MHz		33,8	42,8	33,6	45
155 MHz		38	41,4	37,8	44
200 MHz		43,7	39,8	40	43
250 MHz		49,5	38,3	41	42
300 MHz					
600 MHz					
PSNEXT at 100 MHz -	dB				
PSELFEXT at 100 MHz -	dB				
Char. Impedance at 1-200 MHz -	Ω	100±15		100±15	
DC loop-resistance -	Ω/Km	max 450		190	
Resistance unbalance, max -	%	3		< 0,5	
Capacitance unbalance, max -	pF/Km	1600		< 500	
Capacitance - pF/m		-		49	
Velocity of propagation		0,65		0,71	
Mechanical data:					
Cu -	mm			0,20 mm²	
Conductor -	mm			1	
Screen -				-	
Outer diameter -	mm			6,4	
Outer sheath color standard -				Grey, RAL 7035	
Bending radius -	min			4xD	
Temp. Range -	°C			-20° - +60°	
Weight PVC / LSOH -	Kg/Km			35/34	

Category 7

Installation cable

Horizontal and Building Backbone cable (Class F)



1 - 23 AWG stranded copper conductor
2 - Core isulation foam-skin polythene
3 - Individual shield Al/PET tape
4 - Tinned copper braid
5 - Overall sheath LSOH or flame retardant PVC

Electrical data:

	Standard			S-STP		
	Att.	**NEXT**	**RL**	**Att.**	**NEXT**	**RL**
1 MHz	2,0	80	23	2,0	90	25
4 MHz	3,7	80	23	3,7	90	25
10 MHz	5,9	80	23	5,8	90	25
16 MHz	7,4	80	23	7,3	90	25
20 MHz	8,3	80	23	8,1	90	25
32,25 MHz	10,4	79,6	23	10,3	88	25
62,50 MHz	14,4	75,1	23	14,7	85	25
100 MHz	19,0	72,4	23	18,8	85	25
125 MHz	21,4	71	21,5	21,2	79	24
155 MHz	24,0	69,6	21,5	23,7	78	24
200 MHz	27,5	67,9	21,5	27,1	77	24
250 MHz	31,0	66,5	21,5	30,3	77	24
300 MHz	34,2	65,3	20,7	33,5	75	23
600 MHz	50,1	60,8	17,7	48	72	26

		Standard	S-STP
PSNEXT at 100 MHz -	dB		
PSELFEXT at 100 MHz -	dB	100±15/18/25 f>100/250 MHz	100±15
Char. Impedance at 1-200 MHz -	'Ω	max 300	155
DC loop-resistance -	'Ω/Km	2	< 1
Resistance unbalance, max -	%	1600	< 500
Capacitance unbalance, max -	pF/Km	-	48
Capacitance - pF/m		-	0,72
Velocity of propagation			

Mechanical data:

Cu -	mm	0,4-0,6	0,56
Conductor -	mm		1,4
Screen -			Al/PET foil and braid
Outer diameter -	mm		8,2
Outer sheath color standard -			Grey, RAL 7035
Bending radius -	min		4xD
Temp. Range -	°C		-20° - +60°
Weight PVC / LSOH -	Kg/Km		74/72