



# CAVEL®

LAN 157 - EUROPE



Quality in \_\_\_\_\_

# LAN CABLES

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# PRELIMINARIES

## COMPANY PROFILE

Italiana Conduttori's plant and offices, occupying a surface area of 15,000 sqm, are situated in Gropello Cairoli, in the Province of Pavia, some 30 km along the A7 motorway from Milan en route to Genoa. The yearly production capacity is over 100,000 km of cables.

### CAVEL an EU PRODUCT MADE IN ITALY

Italiana Conduttori has been producing CAVEL coaxial cables since 1968 achieving continuous growth and major recognition in both the Italian and international markets as well as manufacturing Local Area Network cables since 2011.

### CAVEL RESPECTS NATURE

The company is compliant with the EU RoHS Directive banning the use of certain hazardous chemical substances. Besides, pursuant to the REACH Regulation, it is categorised as a downstream "user of substances" and as a "producer of articles". Visit our website and download our Declaration of Conformity to the RoHS Directive, as well as our Declaration in accordance with the REACH Regulation.

### CAVEL WARRANTY

The improved quality of raw materials and the acquisition of modern production equipment allowed us to guarantee our LAN cables produced under the CAVEL brand for a period of 25 years. Both the Certificate and Conditions of Warranty can be downloaded from our website.

### QUALITY AS COMPANY GOAL

The attainment of the Quality Accreditation UNI EN ISO 9002 since 1996, issued by the CSQ Italian national certification body and the international certification network IQNet first, as well as the further certification updating to UNI EN ISO 9001:2008, obtained on 18.11.2010, out themselves the fact that for about 50 years the search for quality has been our attitude.

## SPECIFICATIONS TIA/EIA-568

The latest edition of the Commercial Building Telecommunications Cabling Standard is ANSI/TIA/EIA-568-B.

The Telecommunications Industry Association (TIA) and the Electronic Industries Alliance (EIA) through their TR-42 Technical Committee defined: cabling types, distances, connectors, cable system architectures, cable termination standards and performance characteristics, cable installation requirements and methods of testing installed cable.

The '568-B.2 document specifies the electrical and mechanical requirements of unshielded (UTP) and screened (F/UTP) balanced twisted-pair components. The standard addresses requirements for categories 3, 5e and 6A cabling and component requirements. Categories 7 and 7A are not recognized by TIA/EIA.

Perhaps the best known features of TIA/EIA-568 are the pin/pair assignments for eight-conductor 100-ohm balanced twisted pair cabling. These assignments are named T568A and T568B.

## INTERNATIONAL SPECIFICATIONS ISO/IEC 11801

It represents the reference standard for the so-called structured cabling, suitable for a variety of applications (Analog and ISDN telephony, data communication standards, systems of building control, factory automation) and it covers both balanced cables in copper and fiber optic cabling. The standard is designed for use in commercial districts consisting of a single building or multiple buildings (campus). It is in preparation an updated edition that will unify the requirements for commercial networks, industrial and housewives.

### CLASSES AND CATEGORIES

The standard defines different Classes of connecting channels and categories of cabling, which differ in the maximum frequency at which it is required to provide a certain channel. Limiting ourselves to the balanced cables from the Cat.5e until Cat.7A (the Cat.8 is still under development), we have the following classification.

Class D: connection of up to 100 MHz, using Category 5e cables and dedicated connectors.  
Class E: connecting channel up to 250 MHz, using Category 6 cables and dedicated connectors.  
Class EA channel link up to 500 MHz, using Category 6A cables and dedicated connectors.  
Class F: link/channel up to 600 MHz, using Category 7 cables and dedicated connectors.  
Class FA: link/channel channel up to 1000 MHz, using Category 7A cables and dedicated connectors.

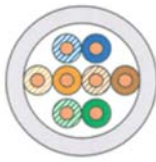
Items of interest unique to the '11801 standard are the work area interface for category 7 and coupling attenuation for copper systems.

The range of cables shown in this publication reflects the classification given above, for copper cables manufactured with solid conductors, for installation in vertical and horizontal mode of permanent link. On the website at the link <http://www.cavel.it/en/products/lan-cables-flexible> the data sheets of copper cables with flexible conductors are also available.



Cat. 5e

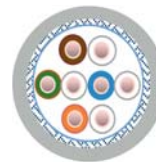
LAN 540



LAN 541



LAN 542



Cat. 6

LAN 640



LAN 641



Cat. 6a

LAN 6A40



LAN 6A43



LAN 6A44



Cat. 7

LAN 745



Cat. 7A

LAN 7A 1000 - 1200 - 1500



Screen Description LEGENDA (from EN 50290-4-2:2007)

**Overall Screen**

**U** Unscreened

**F** single Foil screened

**S** tinned copper braid Screen

**SF** tinned copper braid Screen + Foil

**Pair Screen**

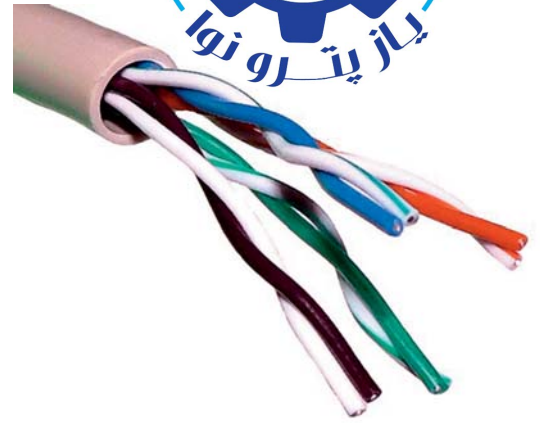
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**UTP** Unscreened Twisted Pairs

**FTP** individual Foil per Twisted Pair; also called PiMF = Pair in Metal Foil

/

# Cat. 5e LAN CABLES



## APPLICATION

LAN Cat.5e twisted pair cable for the transport of signals, was until recently the most commonly used in structured cabling for computer networks such as Ethernet.

It comes from an improved Cat.5. Normally, it provides performance up to 100 MHz and it is suitable for applications 10BASE-T, 100BASE-TX (Fast Ethernet) and 1000BASE-T (Gigabit Ethernet). The first two applications require two pairs of wires, while connecting 1000BASE-T (Gigabit Ethernet) requires four pairs. In some cases, they can be transported over a single cable also multiple signals: eg. Cat.5e can carry two conventional telephone lines as well as 100BASE-TX in a single cable.

Using the technique of PoE (Power over Ethernet) you can transmit up to 25W of power at the same time of data transmission. Cat.5e cable is also used to carry other signals such as telephony and video.

For standard TIA / EIA-568-5 the maximum length of a cable segment is 100 m. The specifications for network protocol 10BASE-T specifies a length of 100 meters between active devices, ie: 90m line-permanent link, 2 connectors and 2 patch cables 5m each. If longer distances are needed it requires the use of active hardware, such as a repeater or switch.

## STANDARD

The specifications for the Cat.5e have been defined by the ANSI / TIA / EIA-568-A, where you specify the performance characteristics and test requirements for frequencies up to 100 MHz, while the types of cables, connectors and cabling topologies are defined by the TIA / EIA-568-B.

The modular connectors 8P8C are the ones most often used for connecting cables Cat.5e, universally known as RJ45. The cable is terminated on connectors in two possible schemes: T568A or T568B. The two systems work equally well and can be mixed in a system provided that the same scheme is used on both ends of each cable.



Regular  
(568A)



1 2 3 4 5 6 7 8

Crossover  
(568B)



1 2 3 4 5 6 7 8

## CABLE CONSTRUCTION

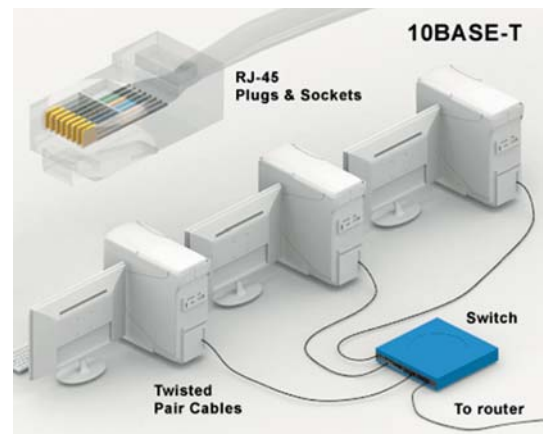
These cables, for the most part are of the type unshielded (U/UTP), though there are also screened (F/UTP). They consist of balanced twisted pair suitable for noise rejection; a high signal-noise ratio, in fact, is able to mitigate both the external interference that the crosstalk coming from adjacent pairs.

Each of the four twisted pairs of a network cable has a different and precise number of twists per meter, this to minimize interference between the pairs. The most common assemblies contain 4 pairs but applications of backbone networks can consist of bundles of up to 100 pairs (not available in our catalog).

The cables are available with solid conductors (shown here) and flexible, that is, with stranded conductor (currently available on our website).

In structured cabling: the "permanent-link" is the cable in the walls, connecting a wall outlet to the central panel and uses cables with solid conductors; while, patch cables, used to connect the wall jack to the computer or other service equipment, they are always of the flexible type.

Given the wide range of applications, Cat.5e cables are available with different sheaths, from simple PVC for indoor, the versatile LSZH for indoor, outdoor and safety in case of fire but also in PE or double sheath PVC/PE for outdoor and underground installation.



# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 540



<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal)
<b>Standard</b>	IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM EIA/TIA 568A EN 50173; EN 50288-3-1 IEC 61156-5 ISO/IEC 11801 2nd ed IEC 60332-1 IEC 60332-1; IEC 60754-2; IEC 61034
<b>Fire-Resistance Rating</b>	PVC LSZH

CAVEL code	LAN 540		LAN 540 ZH		LAN 540 PE		LAN 540 2G		2x LAN 540 ZH	
	Category	Construction DATA	Category	Construction DATA	Category	Construction DATA	Category	Construction DATA	Category	Construction DATA
<b>Conductors</b>	dia. mm	0,51	dia. mm	0,51	dia. mm	0,51	dia. mm	0,51	dia. mm	0,51
<b>Insulation</b>	material	Cu	material	Cu	material	Cu	material	Cu	material	Cu
	material	PE	material	PE	material	PE	material	PE	material	PE
	dia. mm	0,90	dia. mm	0,90	dia. mm	0,90	dia. mm	0,90	dia. mm	0,90
<b>Screen</b>		(U/UTP)		(U/UTP)		(U/UTP)		(U/UTP)		(U/UTP)
<b>Outer Sheath</b>	dia. mm	5,10	dia. mm	5,10	dia. mm	5,10	dia. mm	5,10	dia. mm	10,30 x 5,10
	material	white PVC		grey LSZH		black PE		white PVC		grey LSZH
<b>2° Outer Sheath</b>	dia. mm		dia. mm		dia. mm		dia. mm		dia. mm	
	material		material		material		material		material	
<b>PHISICAL DATA</b>										
<b>Copper Content</b>	kg/km	14,3	kg/km	14,3	kg/km	14,3	kg/km	14,3	kg/km	28,7
<b>Cable Weight</b>	kg/km	30,5	kg/km	31,6	kg/km	27,0	kg/km	39,8	kg/km	64,6
<b>Min. Bending Radius 1/n</b>	mm	20/40	mm	20/40	mm	20/40	mm	20/40	mm	20/40
<b>Temperature</b>	°C	0° ÷ +50°	°C	0° ÷ +50°	°C	0° ÷ +50°	°C	0° ÷ +50°	°C	0° ÷ +50°
	operation	-20° ÷ +60°	operation	-20° ÷ +60°	operation	-20° ÷ +60°	operation	-20° ÷ +60°	operation	-20° ÷ +60°
<b>Max. Tensile Strength</b>	N	100	N	100	N	100	N	150	N	100
<b>Fire Load</b>	MJ/km	440	MJ/km	370	MJ/km	577	MJ/km	871	MJ/km	740
	KWh/km	122	KWh/km	103	KWh/km	160	KWh/km	242	KWh/km	206
<b>ELETRICAL DATA</b>										
<b>Impedance</b>	Ohm	100 ± 5	Ohm	100 ± 5	Ohm	100 ± 5	Ohm	100 ± 5	Ohm	100 ± 5
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48	pF/m	48	pF/m	48	pF/m	48	pF/m	48
<b>Velocity Radio</b>	%	67	%	67	%	67	%	67	%	67
<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m					
at 1	MHz	1,9	25,0	71,0	69,1					
at 10	MHz	6,0	25,0	56,0	50,0					
at 20	MHz	8,5	25,0	51,0	42,5					
at 31,2	MHz	10,7	25,0	49,0	38,3					
at 62,5	MHz	15,7	25,0	44,0	28,3					
at 100	MHz	19,8	20,0	41,0	21,2					
at 155,5	MHz	24,2	15,0	38,0	13,8					
at 200	MHz	27,5	15,0	36,0	8,5					
at 250	MHz	29,2	15,0	35,0	5,8					
at 300	MHz	32,0	15,0	34,0	2,0					
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	≥ 45		≥ 45		≥ 45		≥ 45		≥ 45
<b>DC Conductor Resistance</b>	Ohm/km	95,0		95,0		95,0		95,0		95,0
<b>Loop resistance</b>	Ohm/km	190,0		190,0		190,0		190,0		190,0
<b>Sheath insulation voltage</b>	kV	1,0		1,0		1,0		1,0		1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 2000		> 2000		> 2000		> 2000		> 2000
<b>Voltage Test (1 min DC)</b>	V	1000		1000		1000		1000		1000
<b>STANDAR PAKING</b>										
<b>Put-up</b>	mode	Coil	Coil	Coil		Plastic Reel		Coil		Coil
<b>Unit Length</b>	m	150	300	300		300		200		150
<b>Unit Packing Content</b>	m	900	600	600		600		400		300
<b>Packing Pattern</b>	mod.	S150M	S300L	S300L		R300L		S200L		S150L
<b>Fit CABLEBOX</b>	item	DS100	DS250	DS250		DS250S		DS250		DS250

# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 541





<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM EIA/TIA 568B.2 EN 50173; EN 50288-2-1 IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1; IEC 60754-2; IEC 61034					
<b>Standard</b>	acc. to					
<b>Fire-Resistance Rating</b>	PVC LSZH					
<b>CAVEL code</b>	<b>LAN 541</b>	<b>LAN 541 ZH</b>	<b>LAN 541 PE</b>	<b>LAN 541 2G</b>	<b>2x LAN 541 ZH</b>	
<b>Category</b>	5e F/UTP					
<b>CONSTRUCTION DATA</b>	4x2x AWG24/1					
<b>Conductors</b>	dia. mm material Cu	0,51 Cu	0,51 Cu	0,51 Cu	0,51 Cu	0,51 Cu
<b>Insulation</b>	material dia. mm	PE 1,00 (F/UTP)	PE 1,00 (F/UTP)	PE 1,00 (F/UTP)	PE 1,00 (F/UTP)	PE 1,00 (F/UTP)
<b>Screen</b>	CuSn/0,40					
<b>Drain Wire</b>	Mat./dia. mode					
<b>1. Pairs Screen Film Foil Laminate</b>	material Al/Pet					
<b>Outer Sheath</b>	dia. mm material	6,00 white PVC	6,00 grey LSZH	6,00 black PE	6,00 white PVC 7,20 black PE	13,00 x 6,00 grey LSZH
<b>2° Outer Sheath</b>	dia. mm material					
<b>PHISICAL DATA</b>						
<b>Copper Content</b>	kg/km	15,6	15,6	15,6	15,6	31,2
<b>Cable Weight</b>	kg/km	37,0	37,2	35,4	49,0	74,6
<b>Min. Bending Radius 1/n</b>	mm	25/50	25/50	25/50	30/60	30/60
<b>Temperature installation</b>	°C	0° ÷ +50°	0° a 50°	0° a 50°	0° a 50°	0° a 50°
<b>operation</b>	°C	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°
<b>Max. Tensile Strength</b>	N	100	100	100	150	100
<b>Fire Load</b>	MJ/km KWh/km	510 142	415 115	623 173	1.072 298	898 249
<b>ELETRICAL DATA</b>						
<b>Impedance</b>	Ohm	100 ± 5		100 ± 5		100 ± 5
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48		48		48
<b>Velocity Radio</b>	%	67		67		67
<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m	
at 1	MHz	1,9	25,0	71,0	69,1	
at 10	MHz	6,0	25,0	56,0	50,0	
at 20	MHz	8,5	25,0	51,0	42,5	
at 31,2	MHz	10,7	25,0	49,0	38,3	
at 62,5	MHz	15,7	25,0	44,0	28,3	
at 100	MHz	19,8	20,0	41,0	21,2	
at 155,5	MHz	24,2	15,0	38,0	13,8	
at 200	MHz	27,5	15,0	36,0	8,5	
at 250	MHz	29,2	15,0	35,0	5,8	
at 300	MHz	32,0	15,0	34,0	2,0	
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45		> 45		> 45
<b>DC Conductor Resistance</b>	Ohm/km	95,0		95,0		95,0
<b>Loop Resistance</b>	Ohm/km	190,0		190,0		190,0
<b>Sheath Insulation Voltage</b>	kV	1,0		1,0		1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 2000		> 2000		> 2000
<b>Voltage Test (1 min DC)</b>	V	1000		1000		1000
<b>Shield Transfer Impedance (Zt)</b>						
1 MHz	mΩ/m	< 25		< 25		< 25
10 MHz	mΩ/m	< 8		< 8		< 8
30 MHz	mΩ/m	< 10		< 10		< 10
<b>Screening Attenuation (SA)</b>						
30 - 100 MHz	dB	> 40		> 40		> 40
<b>STANDAR PAKING</b>						
<b>Put-up</b>	mode	Coil		Plastic Reel		Coil
<b>Unit Length</b>	m	300		300		150
<b>Unit Packing Content</b>	m	600		600		300
<b>Packing Pattern</b>	mod.	S300L		R300L		S150L
<b>Fit CABLEBOX</b>	item	DS250		DS250S		DS250

# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

LAN 542



<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T
<b>Standard</b>	acc. to IEEE 802.5 16 MB; ISDN; TPDDI; ATM EIA/TIA 568B.2 EN 50173; EN 50288-2-1 IEC 61156-5 ISO/IEC 11801 2nd ed IEC 60332-1 IEC 60332-1; IEC 60332-3-24
<b>Fire-Resistance Rating</b>	PVC LSZH

<b>CAVEL code</b>	<b>LAN 542</b>		<b>LAN 542 PE</b>	
<b>Category</b>	5e SF/UTP		5e SF/UTP	
<b>Construction</b>	4x2x AWG24/1		4x2x AWG24/1	
<b>CONSTRUCTION DATA</b>				
<b>Conductors</b>	dia. mm material Cu	0,51 Cu	0,51 Cu	
<b>Insulation</b>	material PE dia. mm	PE 1,00	PE 1,00	
<b>Screen</b>		(SF/UTP)	(SF/UTP)	
<b>1. Pairs Screen</b>	mode			
<b>Film Foil Laminate</b>	material	Al/Pet	Al/Pet	
<b>2. Overall Braid Screen</b>	material	CuSn	CuSn	
<b>Braid Optical Coverage</b>	%	61	61	
<b>Outer Sheath</b>	dia. mm material	6,50 white PVC	6,50 black PE	



<b>PHISICAL DATA</b>				
<b>Copper Content</b>	kg/km	24,6	24,6	
<b>Cable Weight</b>	kg/km	50,0	44,1	
<b>Min. Bending Radius 1/n</b>	mm	25/50	25/50	
<b>Temperature installation</b>	°C	0° ÷ +50°	0° ÷ +50°	
<b>operation</b>	°C	-20° ÷ +60°	-20° ÷ +60°	
<b>Max. Tensile Strength</b>	N	100	100	
<b>Fire Load</b>	MJ/km	582	800	
	KWh/km	162	222	

<b>ELETTRICAL DATA</b>				
<b>Impedance</b>				
100 MHz	Ohm	100 ± 5	100 ± 5	
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48	48	
<b>Velocity Radio</b>	%	67	67	

<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m
at 1	MHz	1,9	25,0	71,0	69,1
at 10	MHz	6,0	25,0	56,0	50,0
at 20	MHz	8,5	25,0	51,0	42,5
at 31,2	MHz	10,7	25,0	49,0	38,3
at 62,5	MHz	15,7	25,0	44,0	28,3
at 100	MHz	19,8	20,0	41,0	21,2
at 155,5	MHz	24,2	15,0	38,0	13,8
at 200	MHz	27,5	15,0	36,0	8,5
at 250	MHz	29,2	15,0	35,0	5,8
at 300	MHz	32,0	15,0	34,0	2,0

<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 50	> 50
<b>DC Conductor Resistance</b>	Ohm/km	95,0	95,0
<b>Loop resistance</b>	Ohm/km	< 190	< 190
<b>Sheath Insulation Voltage</b>	kV	1,0	1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 2000	> 2000
<b>Voltage Test (1 min DC)</b>	V	1000	1000
<b>Shield Transfer Impedance (Zt)</b>			
1 MHz	mΩ/m	< 20	< 20
10 MHz	mΩ/m	< 20	< 20
30 MHz	mΩ/m	< 30	< 30
100 MHz	mΩ/m	< 60	< 60
<b>Screening Attenuation (SA)</b>			
30 - 1000 MHz	dB	> 75	> 75

<b>STANDAR PAKING</b>			
<b>Put-up</b>	mode	Coil	Wooden Drum
<b>Unit Length</b>	m	300	500
<b>Unit Packing Content</b>	m	600	500
<b>Packing Pattern</b>	mod.	S300L	PD500
<b>Fit CABLEBOX</b>	item	DS250	

# Cat. 6 and 6A LAN CABLES



## APPLICATION

The cable of Cat.6 are standard for Gigabit Ethernet and other networks compatible with the structured cabling made with Cat.5e, 5 and 3 cables. Compared to the cables of lower categories it has specific and more strict characteristics regarding crosstalk and the system noise.

The cable standard provides performance up to 250 MHz and is suitable for network protocols:

10BASE-T, 100BASE-TX (Fast Ethernet)  
1000BASE-T / 1000BASE-TX (Gigabit Ethernet),  
and 10GBASE-T (10 Gigabit Ethernet).

In 10GBASE-T network, the cable Cat.6 has a maximum length reduced to 55m in an environment of Alien Crosstalk favorable and only 33m in a hostile environment (eg. when many cables are bundled together); on the contrary, that of Cat.6A, characterized for performance up to 500 MHz, improves further the characteristics of Alien Crosstalk and allows its use for up to 100m 10GBASE-T.



## STANDARD

Cables Cat.6 and 6A are with solid conductors (permanent-link) and flexible (see on the web site) are normally terminated with RJ45 modular connectors. If the sockets, plugs and patch cables Cat.6 are not used with a structured cabling Cat.6 equivalent, their overall characteristics will be compromised and degraded. The connectors can use a scheme T568A or T568B pinout and performance are correct as long as both ends of a cable connection have the same pattern.

The Cat.6A is ensured for frequencies up to 500 MHz and this feature has been called the first time with the ANSI / TIA-568-C1 in February 2009.



## CABLE CONSTRUCTION

Cables Cat.6 and 6A must be installed and terminated properly to meet specifications. They must not be bent too tight and their bending radius should be at least four times the outer diameter of the cable. The pairs of wires must be twisted (the crosshairs of polyethylene, said Cross Web, helps couples were maintaining their position during installation) and the outer sheath should not be taken more than 12.7mm.

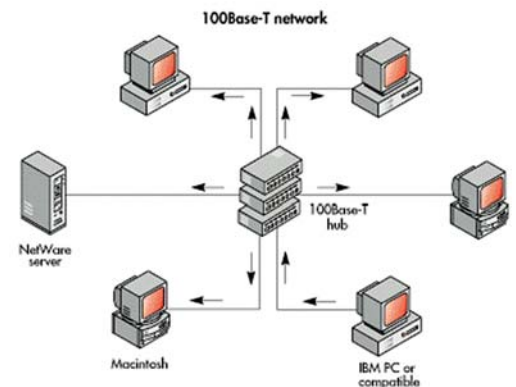
Cat.6 cables are often used in shielded form F/UTP, to improve performance in environments with high electromagnetic interference (EMI).

The shielding aluminum tape is made effective by the presence of a thread of continuity that adheres to the metal tape and runs through the entire cable. The shielded cables Cat.6A can have the screen of the type U/FTP (individually shielded pairs) or F/FTP (Al tape and individually shielded pairs).



## WARNING

After the development of Cat.6, a number of manufacturers began to offer the cables "Cat.6e" as improved Cat.6, presumably according to the previous use of Cat.5e. However, there is no legitimate rule on the Cat.6e that is not a standard recognized by the TIA (Telecommunications Industry Association).



# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 640



<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM EIA-TIA 568B.2 EN 50173; EN 50288-6-1 IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1					
<b>Standard</b>	acc. to					
<b>Fire-Resistance Rating</b>	PVC LSZH					
<b>CAVEL code</b>		<b>LAN 640</b>	<b>LAN 640 ZH</b>	<b>LAN 640 PE</b>	<b>LAN 640 2G</b>	<b>2x LAN 640 ZH</b>
<b>Category</b>		6 U/UTP	6 U/UTP	6 U/UTP	6 U/UTP	2x ( 6 U/UTP )
<b>CONSTRUCTION DATA</b>		4x2x AWG23/1	4x2x AWG23/1	4x2x AWG23/1	4x2x AWG23/1	2x ( 4x2x AWG23/1 )
<b>Conductors</b>	dia. mm	0,57	0,57	0,57	0,57	0,57
	material	Cu	Cu	Cu	Cu	Cu
<b>Insulation</b>	material	PE	PE	PE	PE	PE
	dia. mm	1,00	1,00	1,00	1,00	1,00
<b>Screen</b>		(U/UTP)	(U/UTP)	(U/UTP)	(U/UTP)	(U/UTP)
<b>Outer Sheath</b>	dia. mm	6,60	6,60	6,60	6,60	6,60 x 14,20
	material	white PVC	grey LSZH	black PE	white PVC	grey LSZH
<b>2° Outer Sheath</b>	dia. mm				7,80	
	material				black PE	
<b>PHISICAL DATA</b>						
<b>Copper Content</b>	kg/km	18,6	18,6	18,6	18,6	37,1
<b>Cable Weight</b>	kg/km	42,4	44,4	37,8	58,0	90,5
<b>Min. Bending Radius 1/n</b>	mm	30/60	30/60	30/60	35/70	30/60
<b>Temperature installation</b>	°C	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°
<b>operation</b>	°C	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°
<b>Max. Tensile Strength</b>	N	100	100	100	100	100
<b>Fire Load</b>	MJ/km	660	700	575	1307	1356
	KWh/km	183	195	160	363	377
<b>ELETTRICAL DATA</b>						
<b>Impedance</b>	Ohm	100 ± 5	100 ± 5	100 ± 5	100 ± 5	100 ± 5
<b>100 MHz</b>						
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48	48	48	48	48
<b>Velocity Ratio</b>	%	67	67	67	67	67
<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m	
at 1	MHz	1,8	25,0	100,0	98,2	
at 10	MHz	5,4	25,0	80,0	74,6	
at 20	MHz	7,7	25,0	70,0	62,3	
at 31,2	MHz	9,6	25,0	65,0	55,4	
at 62,5	MHz	13,7	25,0	60,0	43,3	
at 100	MHz	17,4	25,0	60,0	42,6	
at 155,5	MHz	21,9	25,0	55,0	33,1	
at 200	MHz	25,0	20,0	55,0	30,0	
at 250	MHz	28,1	20,0	50,0	21,9	
at 300	MHz	30,8	20,0	45,0	14,2	
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45	> 45	> 45	> 45	> 45
<b>DC Conductor Resistance</b>	Ohm/km	80,0	80,0	80,0	80,0	80,0
<b>Loop resistance</b>	Ohm/km	160	160	160	160	160
<b>Sheath Insulation Voltage</b>	kV	1,0	1,0	1,0	1,0	1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000	> 5000	> 5000	> 5000	> 5000
<b>Voltage Test (1 min DC)</b>	V	1000	1000	1000	1000	1000
<b>STANDAR PAKING</b>						
<b>Put-up</b>	mode	Coil	Coil	Wooden Drum	Wooden Drum	Wooden Drum
<b>Unit Length</b>	m	200	200	500	500	500
<b>Unit Packing Content</b>	m	400	400	500	500	500
<b>Packing Pattern</b>	mod.	S200L	S200L	PD500	PD500	PD500
<b>Fit CABLEBOX</b>	item	DS250	DS250			

# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 641



<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM
<b>Standard</b>	acc. to EIA-TIA 568B.2 EN 50173; EN 50288-5-1 IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1
<b>Fire-Resistance Rating</b>	PVC LSZH

		<b>LAN 641</b>	<b>LAN 641 ZH</b>	<b>LAN 641 PE</b>	<b>LAN 641 2G</b>	<b>2x LAN 641 ZH</b>
<b>CAVEL code</b>		LAN 641	LAN 641 ZH	LAN 641 PE	LAN 641 2G	2x LAN 641 ZH
<b>Category</b>		6 F/UTP	6 F/UTP	6 F/UTP	6 F/UTP	2x ( 6 F/UTP )
<b>CONSTRUCTION DATA</b>		4x2x AWG23/1	4x2x AWG23/1	4x2x AWG23/1	4x2x AWG23/1	2x ( 4x2x AWG23/1 )
<b>Conductors</b>	dia. mm	0,57	0,57	0,57	0,57	0,57
	material	Cu	Cu	Cu	Cu	Cu
<b>Insulation</b>	material	PE	PE	PE	PE	PE
	dia. mm	1,10	1,10	1,10	1,10	1,10
<b>Screen</b>		(F/UTP)	(F/UTP)	(F/UTP)	(F/UTP)	(F/UTP)
<b>Drain Wire</b>	Mat./dia.	CuSn/0,40	CuSn/0,40	CuSn/0,40	CuSn/0,40	CuSn/0,40
<b>Film Foil</b>		Pet	Pet	Pet	Pet	Pet
<b>1. Pairs Screen</b>	mode	Al/Pet	Al/Pet	Al/Pet	Al/Pet	Al/Pet
<b>Film Foil Laminate</b>	material	Al/Pet	Al/Pet	Al/Pet	Al/Pet	Al/Pet
<b>Outer Sheath</b>	dia. mm	7,60	7,60	7,60	7,60	7,60 x 15,20
	material	white PVC	grey LSZH	black PE	white PVC	grey LSZH
<b>2° Outer Sheath</b>	dia. mm				8,80	
	material				black PE	
<b>PHISICAL DATA</b>						
<b>Copper Content</b>	kg/km	19,9	19,9	19,9	19,9	39,9
<b>Cable Weight</b>	kg/km	52,6	55,4	47,2	65,0	112,0
<b>Min. Bending Radius 1/n</b>	mm	30/60	30/60	30/60	35/70	30/60
<b>Temperature installation</b>	°C	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°	0° ÷ +50°
<b>operation</b>	°C	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°	-20° ÷ +60°
<b>Max. Tensile Strength</b>	N	100	100	100	100	100
<b>Fire Load</b>	MJ/km	945	890	1104	1531	1722
	KWh/km	262	250	307	425	492
<b>ELETTRICAL DATA</b>						
<b>Impedance</b>						
100 MHz	Ohm	100 ± 5	100 ± 5	100 ± 5	100 ± 5	100 ± 5
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48	48	48	48	48
<b>Velocity Radio</b>	%	67	67	67	67	67
<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m	
at 1	MHz	1,8	25,0	100,0	98,2	
at 10	MHz	5,4	25,0	80,0	74,6	
at 20	MHz	7,7	25,0	70,0	62,3	
at 31,2	MHz	9,6	25,0	65,0	55,4	
at 62,5	MHz	13,7	25,0	60,0	43,3	
at 100	MHz	17,4	25,0	60,0	42,6	
at 155,5	MHz	21,9	25,0	55,0	33,1	
at 200	MHz	25,0	20,0	55,0	30,0	
at 250	MHz	28,1	20,0	50,0	21,9	
at 300	MHz	30,8	20,0	45,0	14,2	
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45		> 45		> 45
<b>DC Conductor Resistance</b>	Ohm/km	80,0	80,0	80,0	80,0	80,0
<b>Loop Resistance</b>	Ohm/km	160	160	160	160	160
<b>Sheath Insulation Voltage</b>	kV	1,0	1,0	1,0	1,0	1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000	> 5000	> 5000	> 5000	> 5000
<b>Voltage Test (1 min DC)</b>	V	1000	1000	1000	1000	1000
<b>Shield Transfer Impedance (Zt)</b>						
1 MHz	mΩ/m	< 35	< 35	< 35	< 35	< 35
10 MHz	mΩ/m	< 45	< 45	< 45	< 45	< 45
30 MHz	mΩ/m	< 110	< 110	< 110	< 110	< 110
100 MHz	mΩ/m	< 150	< 150	< 150	< 150	< 150
<b>Screening Attenuation (SA)</b>						
30 - 250 MHz	dB	> 50	> 50	> 50	> 50	> 50
250 - 1000 MHz	dB	> 45	> 45	> 45	> 45	> 45
<b>STANDAR PAKING</b>						
Put-up	mode	Coil	Coil	Wooden Drum	Wooden Drum	Wooden Drum
Unit Length	m	200	200	500	500	500
Unit Packing Content	m	400	400	500	500	500
<b>Packing Pattern</b>	mod.	S200L	S200L	PD500	PD500	VD500
Fit CABLEBOX	item	DS250	DS250			

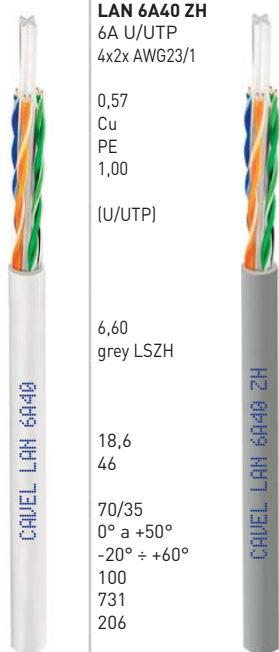
# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 6A40



<b>Application</b>		Primary (Campus), Secondary (Riser), Tertiary (Horizontal)
<b>Standard</b>	acc. to	IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T EIA-TIA 568C.2 EN 50173; EN 50288-11-1 DRAFT IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1
<b>Fire-Resistance Rating</b>	PVC LSZH	

<b>CAVEL code</b>		<b>LAN 6A40</b>	<b>LAN 6A40 ZH</b>
<b>Category</b>		6A U/UTP	6A U/UTP
<b>Construction</b>		4x2x AWG23/1	4x2x AWG23/1
<b>CONSTRUCTION DATA</b>			
<b>Conductors</b>	dia. mm material	0,57 Cu	0,57 Cu
<b>Insulation</b>	material dia. mm	PE 1,00	PE 1,00
<b>Screen</b>		(U/UTP)	(U/UTP)
<b>Outer Sheath</b>	dia. mm material	6,60 white PVC	6,60 grey LSZH
<b>PHISICAL DATA</b>			
<b>Copper Content</b>	kg/km	18,6	18,6
<b>Cable Weight</b>	kg/km	42,5	46
<b>Min. Bending Radius:</b>			
installation / operation	mm	70/35	70/35
<b>Temperature</b>	°C	0° a +50°	0° a +50°
installation	°C	-20° ÷ +60°	-20° ÷ +60°
operation			
<b>Max. Tensile Strength</b>	N	100	100
<b>Fire Load</b>	MJ/km KWh/km	741 206	731 206



<b>ELETTRICAL DATA</b>		<b>LAN 6A40</b>	<b>LAN 6A40 ZH</b>
<b>Impedance</b>			
100 MHz	Ohm	100 ± 5	100 ± 5
<b>Mutual Capacitance (@800Hz)</b>	pF/m	48	48
<b>Velocity Radio</b>	%	67	67

<b>Transmission Data</b>		a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m
at 1	MHz		1,8	25,0	100,0	98,2
at 10	MHz		5,4	25,0	80,0	74,6
at 20	MHz		7,7	25,0	70,0	62,3
at 31,2	MHz		9,6	25,0	65,0	55,4
at 62,5	MHz		13,7	25,0	60,0	43,3
at 100	MHz		17,4	25,0	60,0	42,6
at 155,5	MHz		21,9	25,0	55,0	33,1
at 200	MHz		25,0	20,0	55,0	30,0
at 250	MHz		28,1	20,0	50,0	21,9
at 500	MHz		45,3	15,0	42,0	-3,3

<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45	> 45
<b>DC Conductor Resistance</b>	Ohm/km	80,0	80,0
<b>Loop Resistance</b>	Ohm/km	160	160
<b>Sheath Insulation Voltage</b>	kV	1,0	1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000	> 5000
<b>Voltage Test (1 min DC)</b>	V	1000	1000

<b>STANDAR PAKING</b>		<b>LAN 6A40</b>	<b>LAN 6A40 ZH</b>
<b>Put-up</b>	mode	Coil	Coil
<b>Unit Length</b>	m	200	200
<b>Unit Packing Content</b>	m	400	400
<b>Packing Pattern</b>	mod.	S200L	S200L
<b>Fit CABLEBOX</b>	item	DS250	DS250

# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

## LAN 6A43



## LAN 6A44



<b>Application</b>		Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM			
<b>Standard</b>	acc. to	EIA-TIA 568B.2 EN 50173; EN 50288-5-1 IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1			
<b>Fire-Resistance Rating</b>	PVC LSZH				
<b>CAVEL code</b>		<b>LAN 6A 43 ZH</b>		<b>LAN 6A 44 ZH</b>	
<b>Category</b>		6A U/FTP		6A F/FTP	
<b>CONSTRUCTION DATA</b>		4x2x AWG23/1		4x2x AWG23/1	
<b>Conductors</b>	dia. mm	0,57		0,57	
<b>Insulation</b>	material	Cu		Cu	
	material	PEG		PEG	
	dia. mm	1,40		1,40	
<b>Screen</b>		(U/FTP)		(F/FTP)	
<b>Drain Wire</b>	Mat./dia.	CuSn/0,40		CuSn/0,40	
<b>1. Pairs Screen</b>	mode				
<b>Film Foil Laminate</b>	material	Al/Pet		Al/Pet	
<b>Film Foil</b>	material	Pet		Al/Pet	
<b>Outer Sheath</b>	dia. mm	7,20		7,20	
	material	grey LSZH		grey LSZH	
<b>PHISICAL DATA</b>					
<b>Copper Content</b>	kg/km	20,3		20,3	
<b>Cable Weight</b>	kg/km	55,5		55,5	
<b>Min. Bending Radius 1/n</b>	mm	35/70		35/70	
<b>Temperature installation</b>	°C	0° ÷ +50°		0° ÷ +50°	
<b>operation</b>	°C	-20° ÷ +60°		-20° ÷ +60°	
<b>Max. Tensile Strength</b>	N	340		340	
<b>Fire Load</b>	MJ/km	608		665	
	KWh/km	169		185	
<b>ELETTRICAL DATA</b>					
<b>Impedance</b>					
100 MHz	Ohm	100 ± 5		100 ± 5	
<b>Mutual Capacitance (@800Hz)</b>	pF/m	43		43	
<b>Velocity Radio</b>	%	77		77	
<b>Transmission Data</b>	a 20° C	<b>Att.</b> dB/100m	<b>RL</b> dB	<b>NEXT</b> dB	<b>ACR</b> dB/100m
at 1	MHz	2,1	25,0	90,0	87,9
at 4	MHz	3,6	25,0	90,0	86,4
at 10	MHz	5,4	25,0	90,0	84,6
at 16	MHz	6,8	25,0	90,0	83,2
at 20	MHz	7,7	25,0	85,0	77,3
at 31,2	MHz	9,6	25,0	85,0	75,4
at 62,5	MHz	13,7	25,0	80,0	66,3
at 100	MHz	17,4	25,0	80,0	62,6
at 125	MHz	19,5	25,0	80,0	60,5
at 155,5	MHz	21,9	25,0	80,0	58,1
at 175	MHz	23,3	25,0	75,0	51,7
at 200	MHz	25,0	25,0	75,0	50,0
at 250	MHz	28,1	25,0	75,0	46,9
at 300	MHz	30,9	25,0	70,0	39,1
at 450	MHz	38,3	25,0	70,0	31,7
at 600	MHz	44,8	20,0	65,0	20,2
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45		> 45	
<b>DC Conductor Resistance</b>	Ohm/km	73,0		73,0	
<b>Loop resistance</b>	Ohm/km	146		146	
<b>Sheath Insulation Voltage</b>	kV	1,0		1,0	
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000		> 5000	
<b>Voltage Test (1 min DC)</b>	V	1000		1000	
<b>Shield Transfer Impedance (Zt)</b>					
1 MHz	mΩ/m	< 11		< 11	
10 MHz	mΩ/m	< 5		< 5	
30 MHz	mΩ/m	< 3		< 3	
<b>Screening Attenuation (SA)</b>					
30 - 100 MHz	dB	> 70		> 70	
100 - 1000 MHz	dB	> 50		> 50	
<b>STANDAR PAKING</b>					
<b>Put-up</b>	mode	Wooden Drum		Wooden Drum	
<b>Unit Length</b>	m	500		500	
<b>Unit Packing Content</b>	m	500		500	
<b>Packing Pattern</b>	mod.	PD500		PD500	

# Cat. 7 and 7A LAN CABLES

## APPLICATION AND STANDARD

The standard cable Cat.7 was created to enable the transmission of network protocols 10 Gigabit Ethernet over 100 meters of copper cables. It is compatible with previous networks realized with Cat.5e, 6 and 6A but has characteristics that are more stringent for crosstalk and system noise.

The cable Cat.7 can be terminated either with 8P8C compatible GG45 electrical connectors and with TERA connectors. In combination with said connectors it is suitable to transmit up to 600 MHz.

As of November 2010, all manufacturers of active equipment have chosen to support the connection 8P8C for their products compatible to 10 Gigabit Ethernet over copper, but not connections GG45, ARJ45 or TERA which remain applicable to the Cat.6A.

Channel Class FA and cable Cat.7A were introduced for transmissions up to 1,000 MHz on 10 Gigabit Ethernet over 100m. The cable is suitable for multiple applications, including transmission at 40 Gigabit Ethernet up to 50m, 100 Gigabit Ethernet up to 15m and CATV (bandwidth up to 862 MHz). Each pair offers up to 1.200 MHz of bandwidth.



## CABLE CONSTRUCTION

The cable Cat.7 contains four pairs of copper twisted wires, just like the previous regulations, but to obtain the characteristics described above, were added: both the individual shielding for each pair of wires and that of the cable as a whole (S/FTP).

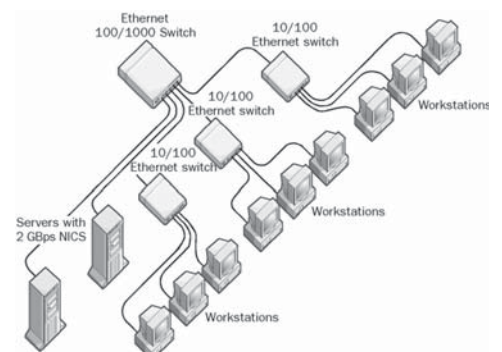
Also, the screen, the stranding of the pairs and the number of turns per unit length of the individual pairs optimize the RF shield and protect better from Crosstalk.



GG45 connector



Tera connector



# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

LAN 745



<b>Application</b>		Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T
<b>Standard</b>	acc. to	IEEE 802.5 16 MB; ISDN; TPDDI; ATM EIA-TIA 568B.2 EN 50173; EN 50288-5-1 IEC 61156-5 ISO/IEC 11801
<b>Fire-Resistance Rating</b>	PVC LSZH	IEC 60332-1 IEC 60332-1

**CAVEL code** LAN 7 454 ZHA  
**Category** 7 S/FTP  
**Construction** 4x2x AWG23/1

**CONSTRUCTION DATA**

<b>Conductors</b>	dia. mm	0,57
	material	Cu
<b>Insulation</b>	material	PEG
	dia. mm	1,40
<b>Screen</b>		(S/FTP)

<b>1. Pairs Screen</b>	mode	
<b>Film Foil Laminate</b>	material	Al/Pet
<b>2. Overall Braid Screen</b>	material	Cu Sn
<b>Braid Optical Coverage</b>	%	41

<b>Outer Sheath</b>	dia. mm	8,00
	material	orange LSZH

**PHISICAL DATA**

<b>Copper Content</b>	kg/km	24,9
<b>Cable Weight</b>	kg/km	59,6
<b>Min. Bending Radius 1/n</b>	mm	80/40

<b>Temperature installation</b>	°C	0° ÷ +50°
<b>operation</b>	°C	-20° ÷ +60°

<b>Max. Pulling Strength</b>	N	320
<b>Fire Load</b>	MJ/km	623
	KWh/km	173

**ELETRICAL DATA**

<b>Impedance</b>		
1 ÷ 100 MHz	Ohm	100 ± 5
<b>Mutual Capacitance (@800Hz)</b>	pF/m	43
<b>Velocity Radio</b>	%	77

Transmission Data		a 20° C	Att. dB/100m	RL dB	NEXT dB	ACR dB/100m
at	1	MHz	2,1	25,0	90,0	87,9
at	4	MHz	3,6	25,0	90,0	86,4
at	10	MHz	5,4	25,0	90,0	84,6
at	16	MHz	6,8	25,0	90,0	83,2
at	20	MHz	7,7	25,0	85,0	77,3
at	31,2	MHz	9,6	25,0	85,0	75,4
at	62,5	MHz	13,7	25,0	80,0	66,3
at	100	MHz	17,4	25,0	80,0	62,6
at	125	MHz	19,5	25,0	80,0	60,5
at	155,5	MHz	21,9	25,0	80,0	58,1
at	175	MHz	23,3	25,0	75,0	51,7
at	200	MHz	25,0	25,0	75,0	50,0
at	250	MHz	28,1	25,0	75,0	46,9
at	300	MHz	30,9	25,0	70,0	39,1
at	450	MHz	38,3	25,0	70,0	31,7
at	600	MHz	44,8	20,0	65,0	20,2

<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45
<b>DC Conductor Resistance</b>	Ohm/km	73,0
<b>Loop resistance</b>	Ohm/km	146
<b>Sheath Insulation Voltage</b>	kV	1,0
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000
<b>Voltage Test (1 min DC)</b>	V	1000

<b>Shield Transfer Impedance (Zt)</b>		
1 MHz	mΩ/m	< 9
10 MHz	mΩ/m	< 7
30 MHz	mΩ/m	< 5

<b>Screening Attenuation (SA)</b>		
30 - 100 MHz	dB	> 80
100 - 1000 MHz	dB	> 85

**STANDAR PAKING**

<b>Put-up</b>	mode	Wooden Drum
<b>Unit Length</b>	m	500
<b>Unit Packing Content</b>	m	500
<b>Packing Pattern</b>	mod.	PD500



# LAN Cables - Symmetrical Twisted Pair Cables for Data Transmission

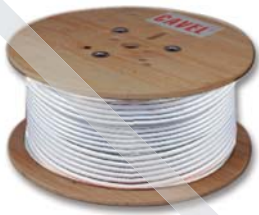
## LAN 7A



<b>Application</b>	Primary (Campus), Secondary (Riser), Tertiary (Horizontal) IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T IEEE 802.5 16 MB; ISDN; TPDDI; ATM												
<b>Standard</b>	acc. to	EIA-TIA 568B.2 EN 50173; EN 50288-5-1 IEC 61156-5 ISO/IEC 11801 IEC 60332-1 IEC 60332-1											
<b>Fire-Resistance Rating</b>	PVC LSZH												
<b>CAVEL code</b>		<b>LAN 7A 1500 ZHA</b>			<b>LAN 7A 1200 ZHA</b>				<b>LAN 7A 1000 ZHA</b>				
<b>Category</b>		7A S/FTP			7A S/FTP				7A S/FTP				
<b>Construction</b>		4x2x AWG22/1			4x2x AWG23/1				4x2x AWG23/1				
<b>CONSTRUCTION DATA</b>													
<b>Conductors</b>	dia. mm	0,64			0,57				0,57				
	material	Cu			Cu				Cu				
<b>Insulation</b>	material	PEG			PEG				PEG				
	dia. mm	1,52			1,40				1,40				
<b>Screen</b>		(S/FTP)											
<b>1. Pairs Screen</b>	mode												
<b>Film Foil Laminate</b>	material	Al/Pet			Al/Pet				Al/Pet				
<b>2. Overall Braid Screen</b>	material	Cu Sn			Cu Sn				Cu Sn				
<b>Braid Optical Coverage</b>	%	40			41				30				
<b>Outer Sheath</b>	dia. mm	8,20			8,00				8,00				
	material	orange LSZH			orange LSZH				orange LSZH				
<b>PHISICAL DATA</b>													
<b>Copper Content</b>	kg/km	29,9			27,0				26,0				
<b>Cable Weight</b>	kg/km	66,3			59,6				58,8				
<b>Min. Bending Radius 1/n</b>	mm	80/40			80/40				80/40				
<b>Temperature installation</b>	°C	0° ÷ +50°											
<b>operation</b>	°C	-20° ÷ +60°											
<b>Max. Pulling Strength</b>	N	380			340				320				
<b>Fire Load</b>	MJ/km	655			623				623				
	KWh/km	182			173				173				
<b>ELETTRICAL DATA</b>													
<b>Impedance</b>		100 ± 5											
<b>1 ÷ 100 MHz</b>	Ohm	100 ± 5											
<b>Mutual Capacitance (@800Hz)</b>	pF/m	43			43				43				
<b>Velocity Radio</b>	%	77			77				77				
<b>Transmission Data</b>	a 20° C	<b>Att.</b>	<b>RL</b>	<b>NEXT</b>	<b>ACR</b>	<b>Att.</b>	<b>RL</b>	<b>NEXT</b>	<b>ACR</b>	<b>Att.</b>	<b>RL</b>	<b>NEXT</b>	<b>ACR</b>
		dB/100m	dB	dB	dB/100m	dB/100m	dB	dB	dB/100m	dB/100m	dB	dB	dB/100m
at 1	MHz	2,0	25,0	90,0	88,0	2,1	25,0	90,0	87,9	2,1	25,0	90,0	87,9
at 4	MHz	3,5	25,0	90,0	86,5	3,6	25,0	90,0	86,4	3,6	25,0	90,0	86,4
at 10	MHz	5,3	25,0	90,0	84,7	5,4	25,0	90,0	84,6	5,4	25,0	90,0	84,6
at 16	MHz	6,6	25,0	90,0	83,4	6,8	25,0	90,0	83,2	6,8	25,0	90,0	83,2
at 20	MHz	7,5	25,0	85,0	77,5	7,7	25,0	85,0	77,3	7,7	25,0	85,0	77,3
at 31,2	MHz	9,5	25,0	85,0	75,5	9,6	25,0	85,0	75,4	9,6	25,0	85,0	75,4
at 62,5	MHz	13,1	25,0	80,0	66,5	13,3	25,0	80,0	66,3	13,3	25,0	80,0	66,3
at 100	MHz	16,5	25,0	80,0	63,5	17,4	25,0	80,0	62,6	17,4	25,0	80,0	62,6
at 125	MHz	18,8	25,0	80,0	61,2	19,5	25,0	80,0	60,5	19,5	25,0	80,0	60,5
at 155,5	MHz	21,0	25,0	80,0	59,0	21,9	25,0	80,0	58,1	21,9	25,0	80,0	58,1
at 175	MHz	21,8	25,0	75,0	53,8	23,3	25,0	75,0	51,7	23,3	25,0	75,0	51,7
at 200	MHz	23,2	25,0	75,0	51,8	25,0	25,0	75,0	50,0	25,0	25,0	75,0	50,0
at 250	MHz	25,4	25,0	75,0	49,6	28,1	25,0	75,0	46,9	28,1	25,0	75,0	46,9
at 300	MHz	28,4	25,0	70,0	41,6	30,3	25,0	70,0	39,1	30,3	25,0	70,0	39,1
at 450	MHz	36,0	25,0	70,0	34,0	38,3	25,0	70,0	31,7	38,3	25,0	70,0	31,7
at 600	MHz	41,0	20,0	65,0	24,0	44,8	20,0	65,0	20,2	44,8	20,0	65,0	20,2
at 750	MHz	47,8	20,0	65,0	17,2	51,0	20,0	65,0	14,0	51,0	20,0	65,0	14,0
at 900	MHz	52,0	20,0	65,0	13,0	54,5	20,0	65,0	10,5	54,5	20,0	65,0	10,5
at 1000	MHz	55,3	20,0	65,0	9,7	58,0	20,0	65,0	7,0	58,0	20,0	65,0	7,0
at 1200	MHz	59,0	20,0	55,0	-4,0	62,0	20,0	60,0	-2,0	-	-	-	-
at 1300	MHz	61,0	15,0	50,0	-11,0	-	-	-	-	-	-	-	-
at 1500	MHz	70,0	15,0	50,0	-20,0	-	-	-	-	-	-	-	-
<b>Coupling Attenuation (30 ÷ 100 MHz)</b>	dB	> 45			> 45				> 45				
<b>DC Conductor Resistance</b>	Ohm/km	57,5			73,0				73,0				
<b>Loop resistance</b>	Ohm/km	115			146				146				
<b>Sheath Insulation Voltage</b>	kV	1,0			1,0				1,0				
<b>Insulation Resistance (500V)</b>	MOhm/km	> 5000			> 5000				> 5000				
<b>Voltage Test (1 min DC)</b>	V	1000			1000				1000				
<b>Shield Transfer Impedance (Zt)</b>													
1 MHz	mΩ/m	< 9			< 9				< 9				
10 MHz	mΩ/m	< 7			< 7				< 7				
30 MHz	mΩ/m	< 5			< 5				< 5				
<b>Screening Attenuation (SA)</b>													
30 - 100 MHz	dB	> 80			> 80				> 80				
100 - 1000 MHz	dB	> 85			> 85				> 85				
<b>STANDAR PAKING</b>													
<b>Put-up</b>	mode	Coil			Wooden Drum				Wooden Drum				
<b>Unit Length</b>	m	100			500				500				
<b>Unit Packing Content</b>	m	200			500				500				
<b>Packing Pattern</b>	mod.	S100L			PD500				PD500				
<b>Fit CABLEBOX</b>	item	DS250											

# ECOLOGICAL PACKING

## THE PAST old pack solution



250 m



AFTER THE USE



305 m



...of just 1 pallet with 12 km of cable,  
WHAT DO YOU DO WITH:  
48 dirty wooden drums  
or 40 useless cavell board boxes?  
**THIS IS A WASTE DISPOSAL PROBLEM!**

## CABLEBOX DISPENSER PACKING SYSTEM

Until recently, coils in a box or non-returnable cardboard and plastic reels were the most popular means of packaging cables. In spite of some inconveniences, these packages were accepted as the norm.

Today, due to environmental studies and concerns, the concept of recycling has become a paramount issue, prompting CAVEL to develop a total solution in terms of **EFFICIENCY**, **ECONOMY** and **ECOLOGY**.

This has led to the introduction of a revolutionary product - the CABLEBOX dispenser - a design based on the concepts of **REDUCTION** and **REUTILISATION**.

The CABLEBOX dispenser is made of a stand containing one reel, which can be easily opened into two parts. These pieces, made of a shock resistant, very strong plastic material, form a cable dispenser with a very long life expectancy.

The "refill" is represented by the coil of cable supplied by CAVEL.

The dispensers are available in two sizes, suitable for either the 100 or 250 metre coil of cable.

They can be carried and are also provided with a shoulder strap. This is a safety feature that enables the installer to move with both hands free.

The cable will always unroll perfectly without assuming a "spiral shape", an annoying drawback of box dispensers that makes installation in ducts very difficult. This is most useful when installing a bundle of cables together in a conduit.

Rewinding excess cable back into the dispenser is very straightforward due to the access through the centre hole.

The sheath of all CAVEL cables supplied in shrinkpack form is provided with a decreasing meter marking, allowing the installer to check the length of a run or drop against the remaining contents of the dispenser.

With the CABLEBOX dispenser packing system, there is no reel disposal to consider, only a small piece of shrinkwrap.

Supplying installers with CABLEBOX dispensers offers the following advantages:

- easier installation
- savings on cost and effort
- opportunity to avoid environmental problems
- improved safety.

## THE PRESENT new smart pack solution



300 m

SHRUNK COIL



Re-usable reel + DS250 dispenser



### AFTER THE USE...

of 1 pallet with 12,0 km cable,  
**YOU WASTE JUST FEW hg OF PAPER AND PLASTIC.**

**THIS IS A TOTAL SOLUTION!**



# PAKING SYSTEM

mod. S150M

6x150m shrunk coils in box = 900m

fit CABLEBOX DS100



M

mod. S100L

2x100m shrunk coils in box = 200m

mod. S150L

2x150m shrunk coils in box = 300m

mod. S200L

2x200m shrunk coils in box = 400m

mod. S300L

2x300m shrunk coils in box = 400m

fit CABLEBOX DS250



L

mod. R300L

2x300m plastic reels in box = 600m

fit CABLEBOX DS250



L

mod. R500XL

1x500m plastic reel in box = 500m

mod. PD

Plywood Drums  
on pallet



XL



PD





mod. WD

Wooden Drums for  
bulk lengths on pallet






WD




## MULTIMEDIA Twin Hybrid Cables

Code and description	Weight kg/km	Size mm	Section
<b>HLC 7591 ZHB</b> 1 Local Area Network cable <b>LANH 74567 ZHB</b> Cat.7 S/FTP 4x2xAWG26/1 white LSZH 2 "dibkom" certified coaxial cable <b>RP913ZH</b> grey LSZH (TI Class A+; SA Class A++)	141	8,6 x 14,6	
<b>HLF 7574 ZHB</b> 1 Local Area Network cable <b>LANH 74567 ZHB</b> Cat.7 S/FTP 4x2xAWG26/1 white LSZH 2 Fiber Optic Cable <b>FOS 710 ZHY4</b> (J-V2H under DIN VDE 0888)	115	8,0 x 12,0	
<b>HLP 753 ZHB</b> 1 Local Area Network cable <b>LANH 74567 ZHB</b> Cat.7 S/FTP 4x2xAWG26/1 white LSZH 2 Loose PE/PP <b>Pipe 3,5/5,0 mm</b>	99	8,0 x 13,0	
<b>HCP 913 ZHB</b> 1 "dibkom" certified coaxial cable <b>RP913ZH</b> grey LSZH (TI Class A+; SA Class A++) 2 Loose PE/PP <b>Pipe 3,5/5,0 mm</b>	101	8,6 x 13,6	

## MULTIMEDIA Bundle Cables

Code and description	Weight kg/km	Size mm	Section
<b>MM 97A45 ZHB</b> 1 "dibkom" certified coaxial cable <b>RP913ZH</b> grey LSZH (TI Classe A+; SA Classe A++) 2 Local Area Network cable <b>LAN 7A 1500 ZHA</b> Cat.7A S/FTP 4x2xAWG22/1 orange LSZH 3 Loose PE/PP <b>Pipe 5,5/7,2 mm</b>	227	15,8 x 17,4	
<b>MCLF 97574 ZHB</b> 1 "dibkom" certified coaxial cable <b>RP913ZH</b> grey LSZH (TI Classe A+; SA Classe A++) 2 Local Area Network cable <b>LANH 74567 ZHB</b> Cat.7 S/FTP 4x2xAWG26/1 white LSZH 3 Loose PE/PP <b>FOS 710 ZHY4</b> (J-V2H under DIN VDE 0888)	219	12,0 x 14,6	
<b>MM 8503 ZHB</b> 1 Coaxial cable <b>RP80</b> grey LSZH (TI Classe A+; SA Classe A++) 2 Local Area Network cable <b>LAN 540ZH</b> Cat.5e U/UTP 4x2xAWG24/1 grey LSZH 3 Loose PE/PP <b>Pipe 3,5/5,0 mm</b>	114	12,1 x 12,3	

## MULTIMEDIA Sockets

Code and description	Size mm	Illustrazione
<b>MMS46W</b> <b>C00TW</b> Single Frame white + <b>MS46</b> R-TV-SAT-2x RJ45 Cat.6 UTP Multimedia Socket for Star Connection + <b>C73TW</b> Cover Plate for R-TV-SAT-2x RJ45 Multimedia Socket white	85 x 85	
<b>MMS45W</b> <b>C00TW</b> Single Frame white + <b>MS45</b> R-TV-SAT-2x RJ45 Cat.6 UTP - FO SC-APC Multimedia Socket for Star Connection + <b>C70TW</b> Cover Plate for R-TV-SAT-2x RJ45 - FO Multimedia Socket white	85 x 85	
<b>MMS88W</b> <b>C00TW</b> Single Frame white + <b>MS88</b> R-TV-SAT-2x RJ45 Cat.6 F/UTP (250 MHz) Multimedia Socket for Star Connection + <b>C70TW</b> Cover Plate for MS88 Socket white	85 x 85	

Day by day, multimedia applications are becoming a must in our modern lifestyle.

Wider broadband, expansion of applications and more and more highspeed communication is required nowadays in all environments and human activities; namely, whether in the office during the hours of work and at home for fun and entertainment as well as on the road, thanks to digital applications in mobility.

Connections to a variety of media, coming from many sources like: Radio, DTV, SAT, CATV, IPTV, HD-TV as well as Telephone, Internet via ADSL and FTTH; all these technologies became our daily bread.

This document, with notes and technical information that follow, wants to provide an aid to all professionals and operators to seize the added value from the use of multimedia cables in all building structures, whether they are: civil, industrial, commercial or public utility. Therefore it is particularly dedicated:

- both to designers of digital networks and those of constructions
- but also to builders and administrators of buildings to modernize
- and to installers of communications systems as well as end users.

Some market players already developed dedicated cabling wall sockets that provide in a single point analog and digital signals; this, allowing to install in every room a multimedia socket in an easy and flexible way. We selected reliable suppliers for these sockets and they are included in our commercial offer and catalogue.

On the other hand, as manufacturer since 1968 of CAVEL communication cables we are able to offer a large variety of Multimedia cables; they can be either twins, called Hybrid cables or built like a bunch of different cables together under an overall outer sheath, better called Multimedia cables.

Designing these cables we count on long years of experience producing TV coaxial cable and in the management of the latest technological and manufacturing resources for LAN cables that we produce since 2011; while fiber optic cables remain outsources just now. In all cases, then we give high priority to the quality of the raw materials, all of European origin, as well as the control of production processes, including the drawing of inner conductor copper wires and testing of finished products.

CAVEL cables can be appreciated primarily for their durability, backed by a specific guarantee. They are also designed to be flexible and to keep small physical dimensions without compromising the achievement of the electrical parameters for stretches and distances prescribed by standards.

In particular, the coaxial cable RP913ZH, present in the compositions that follow, is a coaxial double shielded but capable of providing excellent shielding parameters, comparable, if not superior, to those of coaxial cables provided with triple screen. In fact, its excellence has been certified by the "dibkom-German Institute of Broadband Communications GmbH" which qualifies the cable as appropriate to be installed in the German Broadband communication systems, originally built by Deutsche Bundespost.





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