

CATWay® for CATV-Networks



Cable Solutions for CATV-Networks

THE QUALITY CONNECTION

LEONI

Wire • Cable • Wiring Systems

Type Codes

Copper-Coax Cables

- A** Outdoor cable
- C** Shield or outer conductor of copper wire braiding
- CA** Shield or outer conductor of aluminium wire braiding
- CU** Copper conductor
- F** Flat cable
- FR** Improved flame retardant
- H** Insulation or sheath of halogen-free material
- K** Outer conductor of copper tape applied longitudinally, welded
- NC** Noncorrosivity of combustion gases
- L** Smooth aluminium sheath or outer conductor of aluminium
- (L)2Y** Laminated sheath of AL tape and polyethylene
- STEG** Flat twin wire with web
- (ST)** Static shield of metal tape or plastic-backed metal tape
- TK** Outer conductor of copper tape applied longitudinally
- Y** Insulation, sheath or protective cover of polyvinyl chloride (PVC)
- 2Y** Insulation, sheath or protective cover of polyethylene (PE)
- 2YHO** Insulation of air-spaced polyethylene (PE)
- 02YS** Insulation of cellular polyethylene (PE) with additional skin of solid material (foam skin)
- 02Y** Insulation of cellular polyethylene (PE)
- (ZM)** Metallic strength members

Fiber Optic Cables

- D** Multifiber unit, filled
- E** Single-mode fiber
- ... F ...** Attenuation coefficient and bandwidth or dispersion at a wavelength around 1300 nm
- ... H ...** Attenuation coefficient and bandwidth or dispersion at a wavelength around 1550 nm
- S** Metallic element in the cable core
- (ZM)** Metallic strength members

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CATWay® opens multimedia horizons



More and more data is being sent to more and more recipients using faster and faster speeds and at greater and greater reliability. On a global scale over 200 million households are linked to the cable television network (CATV network). Thanks to their large bandwidth and flexibility modern CATV networks are extraordinarily interesting multimedia access systems of the future. LEONI Special Cables (LSC) is therefore placing its support behind **CATWay®**, the ideal cable solution for 'future compatible' CATV networks.

CATV networks and broadband communication

Multimedia (the integration of data, video and audio) means that the previous separate fields of computing, entertainment and communication technology are becoming ever more closely integrated. Various pieces of equipment such as PC's, TV's and telephones are now being merged to form a multi-functional terminal. The relevant networks are therefore becoming more and more integrated.

Modern CATV networks allow broadband, bi-directional use and are therefore not only the ideal medium for the supply of television and radio programmes, but also for extremely flexible, broadband access networks for interactive services (such as telephone services or data transfer). It is the combination of these properties that make the bi-directional CATV network so ideal as the multimedia network of the future. Future-compatible networks form the basis for modern interactive services.

The CATWay® -network architecture



FN Fiber Node
HE Headend

In classical CATV networks the signals are initially transferred in the trunk area using optical fibre cables and then in the distribution network using coaxial cables. This combination is known as a HFC network (hybrid fibre coax).

Classic HFC Network

As an alternative to this there are network structures in use today in which the distribution area is fully or partially fitted with optical fibre cable technology.¹ Whether you need optical fibre cables², coaxial outdoor cables or coaxial indoor cables, LEONI Special Cables can supply you with reliable cable products that are state of the art.

Coaxial Cabling in trunk, distribution and drop areas

The coaxial share of modern HFC networks has a tree structure. Starting from the fibre node, the signals run through high quality coaxial cables and amplifiers in the Trunk Area into the connected section. The coaxial cables are drawn past the houses in the Distribution Area. The subscribers themselves are connected to special branches in the Drop Area using coaxial cables.

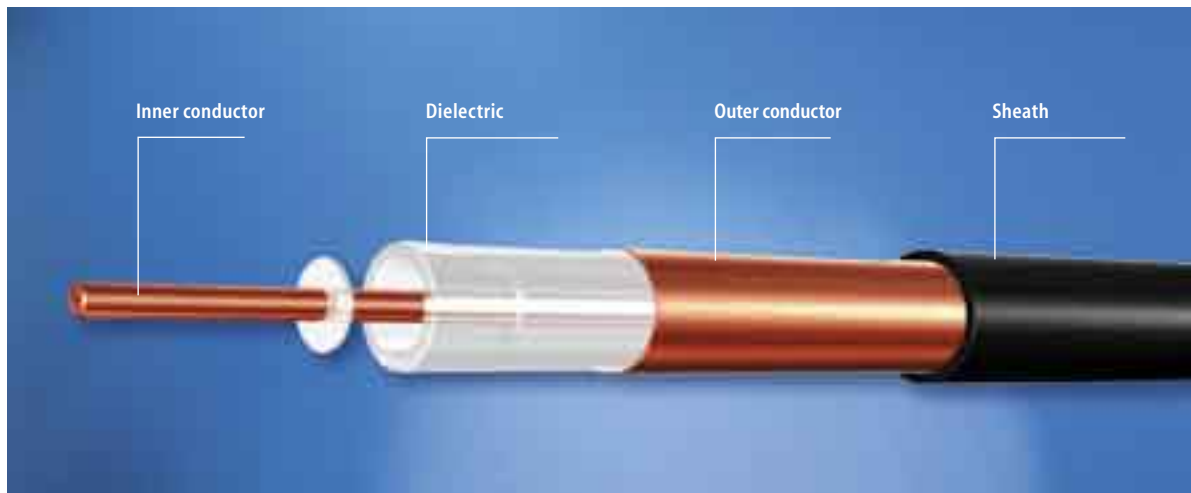
The structure and properties of the cables used for this purpose vary depending on the network level.

¹ Production information about **Flexline™** can be found in our catalogue entitled "**LEONI Flexline – Cable Solutions for Wireless Communication**".

² Production information about LEONI optical fibre cables can be found in our catalogue entitled "**Optical fibre cables – LEONI Q-Line – it's your line**".

Structure and properties of coaxial cables

In principle, each coaxial cable consists of an inner and outer conductor, the dielectric between them and an external sheath.



Inner conductor

High quality solid copper or a copper clad steel wire is used for the inner conductor.

Dielectric

Disc-tube construction



The dielectric is a non-conductive material, in the ideal case, air. To reduce the dielectric losses of the insulation, cavity insulation is often used for trunk area and distribution area cables with PE discs ensuring the centricity of the inner conductor. The disc-tube dielectric is notable for its very good attenuation values.

Polyethylene (solid PE, cellular PE)



In principle a distinction is made between a solid PE and cellular PE dielectric. The cellularisation of the dielectric allows better attenuation values to be achieved compared to the solid PE version, whilst retaining the same dimensions. With modern techniques, a cellularisation level of up to 80 % (in other words up to 80 % air in the dielectric) is possible.

Outer conductor

The outer conductor of the coaxial outdoor cables is particularly important since it protects against radiation and irradiation of electric energy.

At an outdoor coaxial cable the external conductor is made of an overlapping or welded copper band – this design is in particularly widespread use in the network operated by Deutsche Telekom since it offers the best possible protective effect.

Particularly for house cabling, but also in the drop area, cables with outer conductors made of copper or aluminium foil are used, which are fitted with a copper braid to provide additional screening.

Bonded outer conductor

If the outer conductor is bonded to the dielectric, the screening properties will remain constant even if it is subject to frequent bending. In addition the bond ensures a longitudinal water seal between the dielectric and the outer conductor.

Corrugated outer conductor

Coaxial cables with corrugated outer conductors are very flexible. As a result of their minimal bending radii, these cables are notable for their excellent installation properties.

Sheath

The external sheath, which is the last structural element of the coaxial cable, is made of PE for outdoor cables. Inhouse cables have a sheath made of either PVC or halogen-free, flame-resistant materials (FRNC = Flame Retardant Non Corrosive).



Type designation	2YHOK2Y 3.3/13.5-75	2YHOTK2Y 3.3/13.5-75	2YHOK2Y 2.2/8.8-75	2YHOTK2Y 1.7/6.9-75
	QKX	3dB	NKX	6dB
Special features	Top attenuation values, absolutely RF-resistant	Top attenuation values, very good RF-resistance	Top attenuation values, absolutely RF-resistant	Top attenuation values, very good RF-resistance
Construction				
Inner conductor:	Copper wire	Copper wire	Copper wire	Copper wire
Dielectric:	Disc-tube	Disc-tube	Disc-tube	Disc-tube
Outer conductor:	Welded copper tube	Overlapped copper band	Welded copper tube	Overlapped copper band
External sheath:	Polyethylene, black	Polyethylene, black	Polyethylene, black	Polyethylene, black
Mechanical characteristics				
Inner conductor diameter:	3.3 mm	3.3 mm	2.12 mm	1.7 mm
Dielectric diameter:	13.5 mm	13.5 mm	8.80 mm	7.0 mm
Outer conductor diameter:	14.0 mm	14.0 mm	9.40 mm	7.4 mm
Outside diameter:	17.0 mm	18.0 mm	12.50 mm	10.4 mm
Weight:	310 kg/km	310 kg/km	180 kg/km	110 kg/km
Min. bending diameter:	500 mm	500 mm	400 mm	350 mm
Max. tensile strength:	1300 N	1000 N	700 N	320 N
Electrical characteristics				
Inner conductor resistance:	2.1 Ω/km	2.1 Ω/km	5.0 Ω/km	8.0 Ω/km
Characteristic impedance:	75 ± 2 Ω	75 ± 2 Ω	75 ± 2 Ω	75 ± 2 Ω
Capacitance:	50 pF/m	50 pF/m	50 pF/m	50 pF/m
Return loss:				
5 MHz to 300 MHz	≥ 26 dB	≥ 26 dB	≥ 26 dB	≥ 26 dB
300 MHz to 450 MHz	≥ 26 dB	≥ 26 dB	≥ 26 dB	≥ 26 dB
450 MHz to 1000 MHz	≥ 22 dB	≥ 22 dB	≥ 22 dB	≥ 22 dB
1000 MHz to 2150 MHz	—	—	—	—
Screening effectiveness:	120 dB	90 dB	120 dB	90 dB
Attenuation constant at:				
5 MHz	0.39 dB/100m	0.39 dB/100m	0.60 dB/100m	0.78 dB/100m
40 MHz	1.10 dB/100m	1.20 dB/100m	1.80 dB/100m	2.20 dB/100m
100 MHz	1.80 dB/100m	1.90 dB/100m	2.80 dB/100m	3.60 dB/100m
200 MHz	2.60 dB/100m	2.70 dB/100m	4.00 dB/100m	5.10 dB/100m
300 MHz	3.20 dB/100m	3.30 dB/100m	5.00 dB/100m	6.30 dB/100m
450 MHz	4.10 dB/100m	4.20 dB/100m	6.20 dB/100m	7.80 dB/100m
600 MHz	4.80 dB/100m	4.90 dB/100m	7.30 dB/100m	9.10 dB/100m
860 MHz	5.80 dB/100m	6.00 dB/100m	8.90 dB/100m	11.00 dB/100m
1000 MHz	6.40 dB/100m	6.50 dB/100m	9.70 dB/100m	11.90 dB/100m
1350 MHz	—	7.70 dB/100m	11.40 dB/100m	—
1750 MHz	—	8.80 dB/100m	13.20 dB/100m	—
2150 MHz	—	9.90 dB/100m	14.80 dB/100m	—
2400 MHz	—	10.60 dB/100m	15.80 dB/100m	—
Order number	V45460-D21-B436	V45460-D21-B426	V45460-D19-B176	V45460-D17-B176



Type designation

02YK2Y 3.3/13.5-75

02SYK2Y 2.2/8.8-75

Special features

	QKX	NKX
	Very good mechanical and electrical stability	Very good mechanical and electrical stability

Construction

	QKX	NKX
Inner conductor:	Copper wire	Copper wire
Dielectric:	Cellular PE	Cellular PE
Outer conductor:	Welded, bonded copper tube	Welded, bonded copper tube
External sheath:	Polyethylene, black	Polyethylene, black

Mechanical characteristics

	QKX	NKX
Inner conductor diameter:	3.3 mm	2.1 mm
Dielectric diameter:	13.5 mm	8.8 mm
Outer conductor diameter:	14.0 mm	9.4 mm
Outside diameter:	17.0 mm	12.2 mm
Weight:	280 kg/km	150 kg/km
Min. bending diameter:	500 mm	400 mm
Max. tensile strength:	1300 N	700 N

Electrical characteristics

	QKX	NKX
Inner conductor resistance:	2.1 Ω/km	5.0 Ω/km
Characteristic impedance:	75 ± 2 Ω	75 ± 2 Ω
Capacitance:	50 pF/m	50 pF/m
Return loss:		
5 MHz to 300 MHz	≥ 26 dB	≥ 26 dB
300 MHz to 450 MHz	≥ 26 dB	≥ 26 dB
450 MHz to 1000 MHz	≥ 22 dB	≥ 22 dB
1000 MHz to 2150 MHz	≥ 20 dB	≥ 22 dB
Screening effectiveness:	120 dB	120 dB
Attenuation constant at:		
5 MHz	0.39 dB/100m	0.63 dB/100m
40 MHz	1.20 dB/100m	1.80 dB/100m
100 MHz	1.90 dB/100m	2.90 dB/100m
200 MHz	2.70 dB/100m	4.20 dB/100m
300 MHz	3.30 dB/100m	5.20 dB/100m
450 MHz	4.20 dB/100m	6.40 dB/100m
600 MHz	4.90 dB/100m	7.50 dB/100m
860 MHz	6.00 dB/100m	9.10 dB/100m
1000 MHz	6.50 dB/100m	9.90 dB/100m
1350 MHz	7.70 dB/100m	11.70 dB/100m
1750 MHz	8.80 dB/100m	13.60 dB/100m
2150 MHz	9.90 dB/100m	15.30 dB/100m
2400 MHz	10.60 dB/100m	16.20 dB/100m

Order number

L45466-D21-C36

L45466-D19-C66



Type designation

02YSTKC2Y 1.63/7.2-75

02YS(ST)C2Y 1.13/4.8-75

Special features

Very good attenuation values,
RF-resistance,
mechanical and electrical stability

Very good attenuation values,
RF-resistance,
with very small dimensions

Construction

Inner conductor:	Copper wire	Copper wire
Dielectric:	Cellular PE	Cellular PE
Outer conductor:	Overlapped copper foil, bonded and braid	Overlapped aluminium foil and braid
External sheath:	Polyethylene, black	Polyethylene, black

Mechanical characteristics

Inner conductor diameter:	1.63 mm	1.13 mm
Dielectric diameter:	7.20 mm	4.80 mm
Outer conductor diameter:	8.00 mm	5.30 mm
Outside diameter:	10.00 mm	6.80 mm
Weight:	90 kg/km	35 kg/km
Min. bending diameter:	250 mm	70 mm
Max. tensile strength:	200 N	90 N

Electrical characteristics

Inner conductor resistance:	9.0 Ω/km	18.0 Ω/km
Characteristic impedance:	75 ± 2 Ω	75 ± 3 Ω
Capacitance:	54 pF/m	54 pF/m
Return loss:		
5 MHz to 300 MHz	≥ 23 dB	≥ 23 dB
300 MHz to 450 MHz	≥ 23 dB	≥ 23 dB
450 MHz to 1000 MHz	≥ 20 dB	≥ 20 dB
1000 MHz to 2150 MHz	≥ 20 dB	≥ 20 dB
Screening effectiveness:	90 dB	90 dB
Attenuation constant at:		
5 MHz	0.60 dB/100m	1.20 dB/100m
40 MHz	2.12 dB/100m	3.50 dB/100m
100 MHz	3.50 dB/100m	5.60 dB/100m
200 MHz	5.00 dB/100m	8.00 dB/100m
300 MHz	6.20 dB/100m	9.90 dB/100m
450 MHz	7.70 dB/100m	12.30 dB/100m
600 MHz	9.00 dB/100m	4.40 dB/100m
860 MHz	11.00 dB/100m	17.60 dB/100m
1000 MHz	11.90 dB/100m	19.10 dB/100m
1350 MHz	14.00 dB/100m	22.60 dB/100m
1750 MHz	16.20 dB/100m	26.10 dB/100m
2150 MHz	18.20 dB/100m	29.40 dB/100m
2400 MHz	19.30 dB/100m	31.40 dB/100m

Order number

L45466-D18-C96

V45466-D12-C6



Type designation

02YWK2Y 3.9/15.2-75

02YWK2Y 2.65/10.6-75

Special features

	QKX	NKX
	Minimal bending radii, high flexibility	Minimal bending radii, high flexibility

Construction

Inner conductor:	Copper wire	Copper wire
Dielectric:	Cellular PE	Cellular PE
Outer conductor:	Welded copper tube, corrugated	Welded copper tube, corrugated
External sheath:	Polyethylene, black	Polyethylene, black

Mechanical characteristics

Inner conductor diameter:	3.9 mm	2.65 mm
Dielectric diameter:	15.2 mm	10.6 mm
Outer conductor diameter:	17.2 mm	12 mm
Outside diameter:	19.8 mm	14.3 mm
Weight:	300 kg/km	200 kg/km
Min. bending diameter:	300 mm	250 mm
Max. tensile strength:	1500 N	1000 N

Electrical characteristics

Inner conductor resistance:	1.5 Ω /km	3.5 Ω /km
Characteristic impedance:	75 \pm 2 Ω	75 \pm 2 Ω
Capacitance:	50 pF/m	50 pF/m
Return loss:		
5 MHz to 300 MHz	\geq 26 dB	\geq 26 dB
300 MHz to 450 MHz	\geq 26 dB	\geq 26 dB
450 MHz to 1000 MHz	\geq 22 dB	\geq 22 dB
1000 MHz to 2000 MHz	\geq 20 dB	\geq 22 dB
Screening effectiveness:	120 dB	120 dB
Attenuation constant at:		
5 MHz	0.35 dB/100m	0.54 dB/100m
40 MHz	1.00 dB/100m	1.60 dB/100m
100 MHz	1.60 dB/100m	2.50 dB/100m
200 MHz	2.40 dB/100m	3.60 dB/100m
300 MHz	3.00 dB/100m	4.40 dB/100m
450 MHz	3.70 dB/100m	5.50 dB/100m
600 MHz	4.40 dB/100m	6.40 dB/100m
860 MHz	5.40 dB/100m	7.90 dB/100m
1000 MHz	5.80 dB/100m	8.60 dB/100m
1350 MHz	7.00 dB/100m	10.10 dB/100m
1750 MHz	8.20 dB/100m	11.70 dB/100m
2150 MHz	9.30 dB/100m	13.20 dB/100m
2400 MHz	9.90 dB/100m	14.10 dB/100m

Order number

L45466-D22-C146

L45466-D21-C46



2YK2Y 1.1/7.3-75
2YTK2Y 1.1/7.3-75

2YTKC2Y 0.75/4.8-75

Type designation	2YK2Y 1.1/7.3-75	2YTK2Y 1.1/7.3-75	2YTKC2Y 0.75/4.8-75
	IKX	IKX	12dB
Special features	Absolutely RF-resistant	Very good RF-resistance	Very good RF-resistance, small dimensions
Construction			
Inner conductor:	Copper wire	Copper wire	Copper wire
Dielectric:	Solid PE	Solid PE	Solid PE
Outer conductor:	Welded copper tube	Overlapped copper band	Overlapped copper foil, with braid
External sheath:	Polyethylene, black	Polyethylene, black	Polyethylene, black
Mechanical characteristics			
Inner conductor diameter:	1.13 mm	1.13 mm	0.72 mm
Dielectric diameter:	7.30 mm	7.30 mm	4.80 mm
Outer conductor diameter:	7.60 mm	7.60 mm	5.40 mm
Outside diameter:	10.60 mm	10.40 mm	7.20 mm
Weight:	140 kg/km	110 kg/km	50 kg/km
Min. bending diameter:	320 mm	320 mm	75 mm
Max. tensile strength:	500 N	250 N	70 N
Electrical characteristics			
Inner conductor resistance:	18.0 Ω/km	18.0 Ω/km	42.0 Ω/km
Characteristic impedance:	75 ± 2 Ω	75 ± 2 Ω	75 ± 3 Ω
Capacitance:	67 pF/m	67 pF/m	67 pF/m
Return loss:			
5 MHz to 300 MHz	≥ 26 dB	≥ 26 dB	≥ 23 dB
300 MHz to 450 MHz	≥ 26 dB	≥ 26 dB	≥ 23 dB
450 MHz to 1000 MHz	≥ 22 dB	≥ 22 dB	≥ 20 dB
1000 MHz to 2150 MHz	≥ 22 dB	≥ 22 dB	≥ 20 dB
Screening effectiveness:	120 dB	90 dB	90 dB
Attenuation constant at:			
5 MHz	1.10 dB/100m	1.10 dB/100m	1.70 dB/100m
40 MHz	3.30 dB/100m	3.30 dB/100m	5.00 dB/100m
100 MHz	5.30 dB/100m	5.30 dB/100m	8.00 dB/100m
200 MHz	7.60 dB/100m	7.60 dB/100m	11.60 dB/100m
300 MHz	9.50 dB/100m	9.50 dB/100m	14.50 dB/100m
450 MHz	11.90 dB/100m	11.90 dB/100m	18.00 dB/100m
600 MHz	13.90 dB/100m	13.90 dB/100m	21.20 dB/100m
860 MHz	17.00 dB/100m	17.00 dB/100m	25.90 dB/100m
1000 MHz	18.60 dB/100m	18.60 dB/100m	28.30 dB/100m
1350 MHz	22.10 dB/100m	22.10 dB/100m	33.60 dB/100m
1750 MHz	25.80 dB/100m	25.80 dB/100m	39.10 dB/100m
2150 MHz	29.10 dB/100m	29.10 dB/100m	44.30 dB/100m
2400 MHz	31.10 dB/100m	31.10 dB/100m	47.30 dB/100m
Order number	V45466-D18-B76	L45466-D18-B126	V45466-D15-B176

Networks for the future using hybrid cables

A-DS(L)2Y 1x2E9/125
 CU02YS 2x2x0.51 LG
 02YS(ST)C2Y 1.13/4.8-75 STEG



A-DS(ZM)2Y 2x4E9/125
 CU2YHOTK 2Y 3.3/13.5-75



Application

Currently one fibre node with its downstream amplifier cascades typically supplies 500 subscribers. These 500 subscribers of the bi-directional HFC network have to split the available return path bandwidth. If the number of interactive services through HFC networks increases in the future, this may result in bottlenecks in the return path. To counteract this, the first amplifier of a coaxial branch is replaced by a fibre node, which must be connected by a new optical fibre cable.

If this aspect for future use is taken into account in the design of a new HFC network, the use of hybrid cables (optical fibre + coaxial) can prevent subsequent new installation costs for optical fibre cables. The originally used coaxial cable is only available for the remote supply of the following active components.

Structure

Two different types of hybrid cables are available:

- 3 dB coaxial cable combined with 8 single-mode fibres for use in trunk and distribution areas.
- 12 dB coaxial cable combined with 3 single-mode and 2 twisted-pair elements for use in the drop area and in the house.

The TP cables may be used either for data transfer or for the remote supply of the subscriber's active components.

Special features

- Very good RF-screening
- Very good mechanical and electrical long term stability
- High tensile strength

Type designation

**A-DS(L)2Y 1x2E9/125
CU02YS 2x2x0.51 LG
02YS(ST)C2Y 1.13/4.8-75 STEG**

**A-DS(ZM)2Y 2x4E9/125
CU2YHOTK 2Y 3.3/13.5-75**

Special features

	12 dB	3 dB
Special features	Combined coaxial / twisted pair / fibre optic cable for internal and external installation	Combined coaxial / fibre optic cable for external installation

Construction

Inner conductor:	Copper wire	Copper wire
Dielectric:	Solid PE	Disc-tube
Outer conductor:	Overlapped copper foil and braid	Overlapped copper foil
External sheath:	Polyethylene, green	Polyethylene, black
Fibres:	1 multi-fibre loose tube with 2 fibres E9/125	2 multi-fibre loose tubes with 4 fibres each E9/125
Pairs:	2 twisted copper pairs 0.51/1.0-100 Ω	

Mechanical characteristics

Inner conductor diameter:	1.13 mm	3.3 mm
Dielectric diameter:	4.80 mm	13.5 mm
Outer conductor diameter:	5.50 mm	14.0 mm
Outside diameter:	8.7 x 17.7 mm	18.0 x 26.0 mm
Weight:	140 kg/km	330 kg/km
Min. bending diameter:	150 mm	500 mm
Max. tensile strength:	70 N	1000 N

Electrical characteristics

Inner conductor resistance:	18 Ω /km	2.1 Ω /km
Characteristic impedance:	75 \pm 3 Ω	75 \pm 2 Ω
Capacitance:	54 pF/m	50 pF/m
Return loss:		
5 MHz to 300 MHz	\geq 22 dB	> 26 dB
300 MHz to 450 MHz	\geq 20 dB	> 26 dB
450 MHz to 1000 MHz	\geq 18 dB	> 22 dB
1000 MHz to 2000 MHz	\geq 16 dB	—
Screening effectiveness:	\geq 90 dB	> 90 dB
Attenuation at:		
5 MHz	1.20 dB/100m	0.39 dB/100m
40 MHz	3.50 dB/100m	1.20 dB/100m
100 MHz	5.60 dB/100m	1.90 dB/100m
200 MHz	8.00 dB/100m	2.70 dB/100m
300 MHz	9.90 dB/100m	3.30 dB/100m
450 MHz	12.30 dB/100m	4.20 dB/100m
600 MHz	14.40 dB/100m	4.90 dB/100m
860 MHz	17.60 dB/100m	6.00 dB/100m
1000 MHz	19.10 dB/100m	6.50 dB/100m
1350 MHz	22.60 dB/100m	7.70 dB/100m
1750 MHz	26.10 dB/100m	8.80 dB/100m
2150 MHz	29.40 dB/100m	9.90 dB/100m
2400 MHz	31.40 dB/100m	10.60 dB/100m
Maximum attenuation fibre:		
at 1310 nm	0.45 dB/km	0.45 dB/km
at 1550 nm	0.30 dB/km	0.30 dB/km
Attenuation pairs:		
40 MHz	10.00 dB/100m	—
100 MHz	16.00 dB/100m	—
200 MHz	23.00 dB/100m	—
300 MHz	28.00 dB/100m	—
Order number	V46904-D2-U26	V46904-D8-U130

Cable in cable protection pipes



On request LEONI will manufacture CATV cables which are installed in a protective pipe. The PE pipe protects the cables from strong mechanical stresses in demanding installation areas. In addition they allow very low cost installation since there is no need to blow or draw in the cables after installing the pipes.

Coaxial indoor cables



Application

The range of multimedia services are growing as well as the requirements for in-house cabling. Modern indoor cables open the possibility to transmit both analogue and digital signals with a very large bandwidth (they are also suitable for satellite receiver systems).

CATWay[®] allows bi-directional communication, data transmission, television and interactive services such as internet or homeworking. Reference: Dutch PTT specification, EN 50117, Society of Cable Telecommunications Engineers, INC.

Special features

- Particularly RF-resistant screen structures
- Long term stability
- Low bending radius
- Also available as FRNC^{*}-type

^{*}FRNC = Flame Retardant
Non Corrosive

CATWay® -ProShield

02YS(ST)C(ST)H 1.13/4.8-75 FRNC WS



Application

The LEONI ProShield was developed specifically to fulfill the requirement for non interference transmission.

From 1Mhz on, ProShield already exceeds the required standard of 85db. Due to the fixed adhesion of the inner foil with the dielectric, the first-class transmission properties are still maintained when the cable has to be bent to a small radius on installation.

Design

The inner conductor is composed of bare copper wire and is surrounded by an insulation layer of foamed polyethylene (PE) with skin. The glued aluminium-coated foil (overlapped) is mounted lengthways. Shield braiding of tinned copper wires (0.15 mm, Ø VZN) with a coverage of approximately 95% guarantees an excellent screening. An additional layer of aluminium-coated foil (overlapped) and the jacket (FRNC) is mounted on the shield braiding.

Special features

CATWay®-ProShield provides first class shielding for the return channel.

Type designation 02YS(ST)C(ST)H 1.13/4.8-75 FRNC WS

Construction

Inner conductor:	Copper wire
Dielectric:	Foamed-PE with skin
Outer conductor:	Glued aluminium-coated foil (overlapped), mounted lengthways, shield braiding of tinned copper wires
External sheath:	Thermoplastic Copolymer (FRNC) WS

Mechanical characteristics

Inner conductor diameter:	1.13 mm
Dielectric diameter:	4.8 mm
Outer conductor diameter:	5.9 mm
Outside diameter:	7.1 mm
Weight:	72 kg/km
Min. bending diameter:	106 mm (repeated), 71 mm (single)
Max. tensile strength:	90 N

Electrical characteristics

Inner conductor resistance:	18 Ω /km
Characteristic impedance:	75 \pm 3 Ω
Capacitance:	54 pF/m
Return loss:	5 MHz to 40 MHz \geq 26 dB
	40 MHz to 450 MHz \geq 22 dB
	450 MHz to 860 MHz \geq 20 dB
	860 MHz to 2000 MHz \geq 18 dB
	2000 MHz to 2400 MHz \geq 16 dB
Screening effectiveness:	
	1 MHz to 30 MHz \geq 90 dB
	30 MHz to 2400 MHz \geq 100 dB
Attenuation at:	5 MHz 1.20 dB/100m
	30 MHz 3.20 dB/100m
	50 MHz 4.40 dB/100m
	100 MHz 6.00 dB/100m
	200 MHz 8.30 dB/100m
	500 MHz 14.00 dB/100m
	800 MHz 17.80 dB/100m
	950 MHz 19.60 dB/100m
	2150 MHz 30.40 dB/100m
	2400 MHz 31.50 dB/100m

Order number L45466-D15-C286



Type designation

02YS(ST)CY 1.13/4.8-75 WS

Construction

Inner conductor:	Copper wire
Dielectric:	Solid PE
Outer conductor:	Overlapped aluminium foil and braid
External sheath:	PVC

Mechanical characteristics

Inner conductor diameter:	1.13 mm
Dielectric diameter:	4.8 mm
Outer conductor diameter:	5.3 mm
Outside diameter:	6.8 mm
Weight:	41 kg/km
Min. bending diameter:	70 mm
Max. tensile strength:	180 N

Electrical characteristics

Inner conductor resistance:	18 Ω /km
Characteristic impedance:	75 \pm 3 Ω
Capacitance:	54 pF/m
Return loss:	5 MHz to 300 MHz > 22 dB
	300 MHz to 450 MHz > 20 dB
	450 MHz to 1000 MHz > 18 dB
	1000 MHz to 2150 MHz > 16 dB
Screening effectiveness:	90 dB
Attenuation at:	5 MHz 1.20 dB/100m
	40 MHz 3.50 dB/100m
	100 MHz 5.60 dB/100m
	200 MHz 8.00 dB/100m
	300 MHz 9.90 dB/100m
	450 MHz 12.30 dB/100m
	600 MHz 14.40 dB/100m
	860 MHz 17.60 dB/100m
	1000 MHz 19.10 dB/100m
	1350 MHz 22.60 dB/100m
	1750 MHz 26.10 dB/100m
	2150 MHz 29.40 dB/100m
	2400 MHz 31.40 dB/100m
Order number (Standard):	V45466-D12-C25
Order number (FRNC):	L45466-D12-C56



Type designation **02YS(ST)CY 2x1.13/4.8-75 WS F**

Construction

Inner conductor:	Copper wire
Dielectric:	Cellular PE
Outer conductor:	Overlapped aluminium foil and braid
External sheath:	PVC

Mechanical characteristics

Inner conductor diameter:	1.13 mm
Dielectric diameter:	4.80 mm
Outer conductor diameter:	5.50 mm
Outside diameter:	6.8 x 14 mm
Weight:	105 kg/km
Min. bending diameter:	70 mm
Max. tensile strength:	360 N

Electrical characteristics

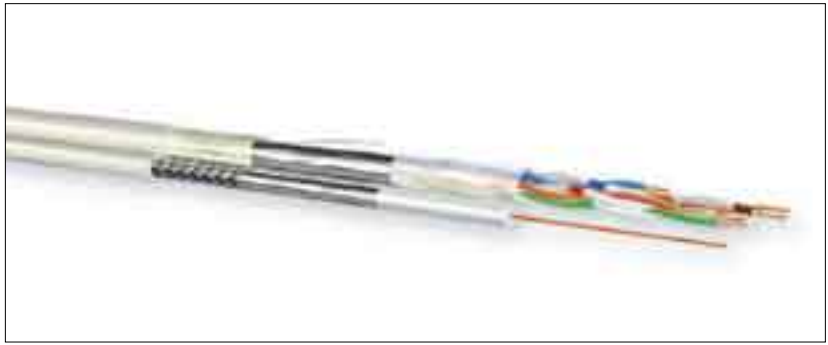
Inner conductor resistance:	18 Ω/km
Characteristic impedance:	75 ± 3 Ω
Capacitance:	54 pF/m
Return loss:	5 MHz to 300 MHz > 22 dB
	300 MHz to 450 MHz > 20 dB
	450 MHz to 1000 MHz > 18 dB
	1000 MHz to 2150 MHz > 16 dB
Screening effectiveness:	90 dB
Attenuation at:	5 MHz 1.20 dB/100m
	40 MHz 3.50 dB/100m
	100 MHz 5.60 dB/100m
	200 MHz 8.00 dB/100m
	300 MHz 9.90 dB/100m
	450 MHz 12.30 dB/100m
	600 MHz 14.40 dB/100m
	860 MHz 17.60 dB/100m
	1000 MHz 19.10 dB/100m
	1350 MHz 22.60 dB/100m
	1750 MHz 26.10 dB/100m
	2150 MHz 29.40 dB/100m
	2400 MHz 31.40 dB/100m

Order number (Standard): **V45466-D112-C25**

Order number (FRNC): **L45466-D112-C26**

Combined coaxial-data cables

02Y(ST)C 0.8/3.5-75
02YS(ST)Y 4x2x0.52 WS STEG



Application

Combined coaxial-data cables can be used to transmit signals for all communication services in buildings.

The user benefits from the high flexibility with which he can combine and position his end units for cable TV, SAT TV, telephone, ISDN, xDSL, computer networking, etc. Since all the data connection sockets in the house are supplied by a single cable, the work of planners and installers will be considerably simplified.

Special features

- Data cable of category 5 and 75 Ω coaxial cable
- Suitable for standard empty pipes with a diameter of 16 mm
- Simple installation as a result of small bending radii

Type designation: **02Y(ST)C 0.8/3.5-75**
02YS(ST)Y 4x2x0.52 WS STEG

Construction

Inner conductor:	Copper wire
Dielectric:	Cellular PE
Outer conductor:	Aluminium foil and shield
External sheath:	PVC
CAT5-element:	4 x 2 x 0.52/1.0

Mechanical characteristics

Inner conductor diameter:	0.8 mm
Dielectric diameter:	3.5 mm
Outer conductor diameter:	4.0 mm
Outside diameter:	5.5 mm x 11.0 mm
Weight:	70 kg/km
Min. bending diameter:	50 mm
Max. tensile strength:	150 N

Electrical characteristics (Coax)

Inner conductor resistance:	36 Ω /km
Characteristic impedance:	75 \pm 3 Ω
Capacitance:	54 pF/m
Return loss:	
5 MHz to 300 MHz	> 22 dB
300 MHz to 450 MHz	> 20 dB
450 MHz to 1000 MHz	> 18 dB
1000 MHz to 2150 MHz	> 16 dB
Screening effectiveness:	90 dB
Attenuation at (Coax):	
5 MHz	1.70 dB/100m
40 MHz	4.90 dB/100m
100 MHz	7.80 dB/100m
200 MHz	11.30 dB/100m
300 MHz	14.10 dB/100m
450 MHz	17.70 dB/100m
600 MHz	20.70 dB/100m
860 MHz	25.40 dB/100m
1000 MHz	27.70 dB/100m
1350 MHz	33.00 dB/100m
1750 MHz	38.50 dB/100m
2150 MHz	43.60 dB/100m
2400 MHz	46.60 dB/100m

Electrical characteristics (CAT5)

Inner conductor resistance:	85 Ω /km
Characteristic impedance:	100 Ω
Capacitance:	48 pF/m
Attenuation at (CAT5):	
1 MHz	2.00 dB/100m
4 MHz	3.80 dB/100m
10 MHz	5.90 dB/100m
16 MHz	7.50 dB/100m
20 MHz	8.40 dB/100m
62.5 MHz	15.00 dB/100m
100 MHz	19.10 dB/100m

Order number (Standard): **L45466-D114-C15**

Order number (FRNC): **L45466-D114-C16**

Quality and the Environment



LEONI quality management

A consistently high level of quality is indispensable for our products. Therefore the entire process at LEONI – from a product's planning to its completion – is subjected to permanent monitoring.

Our quality management system is certified in accordance with DIN EN ISO 9001 : 2000 and is monitored permanently.

Environment-friendly and safe

Of course halogen-free versions of all the cables in our range are also available. This does not reduce the strain on the environment, it also means less smoke and corrosive emissions in the event of a fire – for your safety.

LEONI environmental management

For us, business success with ecological responsibility is not a contradiction in terms. Because of this, environmental protection is an intrinsic element of our corporate activities. Our environmental management system is certified in accordance with DIN EN ISO 14001, confirming that our environmental policy is effectively implemented.

**This is where you will find more information
about our products:**

Product brochures:

Insulated Strands and Wires

Flexible Cables

Radio-frequency Cables

Switchboard Cables

**Heat Resistant Cables,
Thermocouple Cables**

**LEONI FieldLine
Special Cables for Automation Systems**

**LEONI FieldLine
Cabels for Industrial Ethernet Applications**

Special brochures:

**LEONI Special Cables Friesoythe
Flexibility made to measure**

**FlexLine™
Cable Solutions for Wireless Communication**

**CATWay®
Cable Solutions for CATV-Networks**

**Special Cables for
Diagnostic and Therapy Systems**

Other LEONI product catalogues:

Copper Data Cables

Fibre Optic Cables

Coaxial Cables

Power Cables

LEONI Special Cables GmbH

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