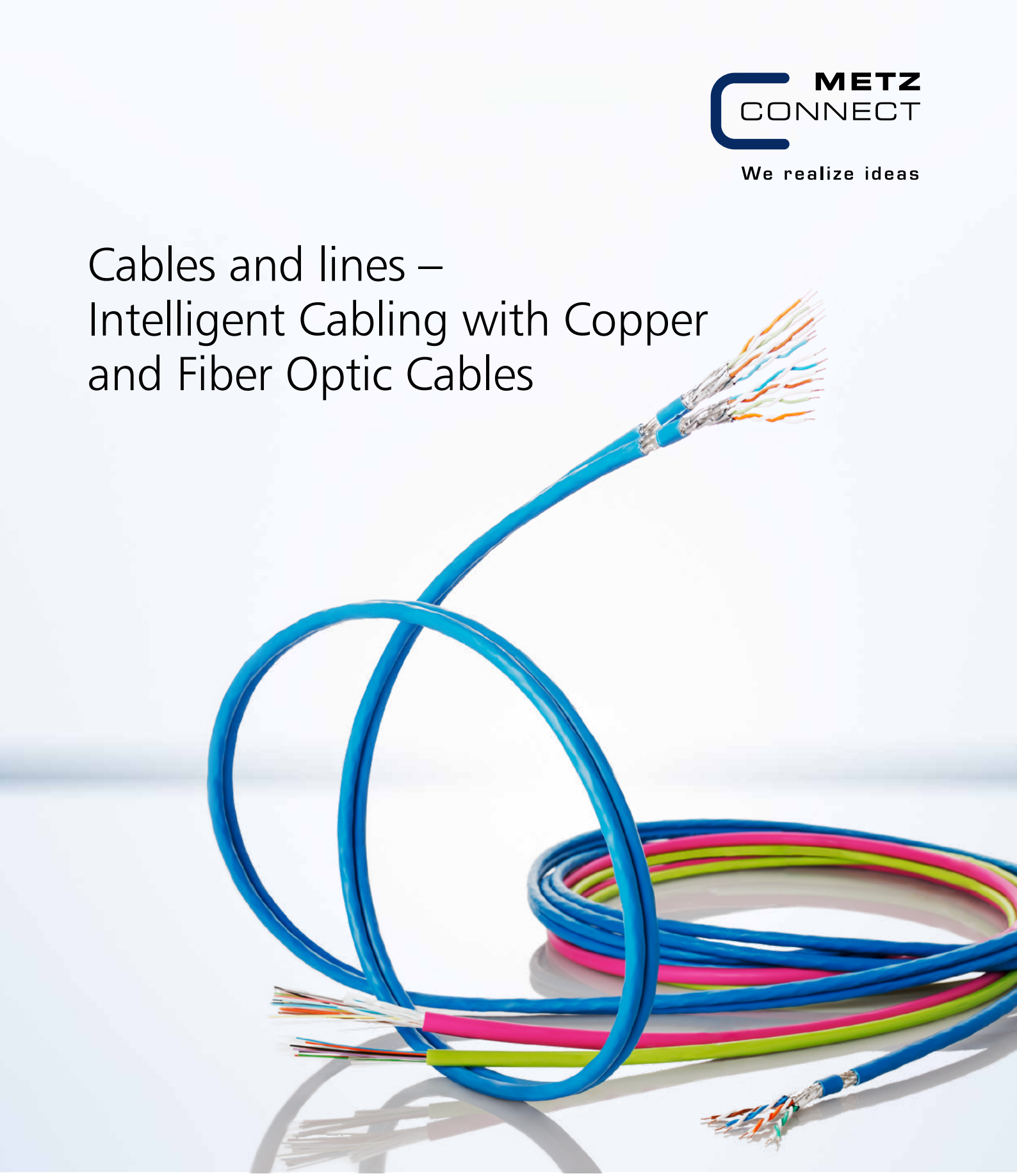
METZ CONNECT

We realize ideas

Cables and lines – Intelligent Cabling with Copper and Fiber Optic Cables



P | Cabling

Cable concepts with a perspective

The world is becoming more and more networked. Consistent as well as transparent information - available everywhere and at all times - devices that communicate with other devices to depict processes - all of this is increasingly determining our daily lives. All this requires reliable connection technology. Creating perfect connections - that is the core competence of METZ CONNECT.

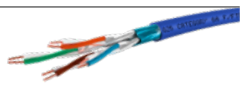
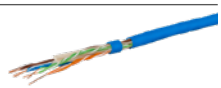
The decision between fiber optic or copper data cables as the ideal solution for the workplace depends on many factors: deployment environment, network technology and the planning horizon. Whatever you opt for, with fiber optic (FO) or copper data cables from METZ CONNECT, which are optimally tailored to the requirements of all structural levels of local networks, you'll be on the safe side in the future.

Freedom of choice

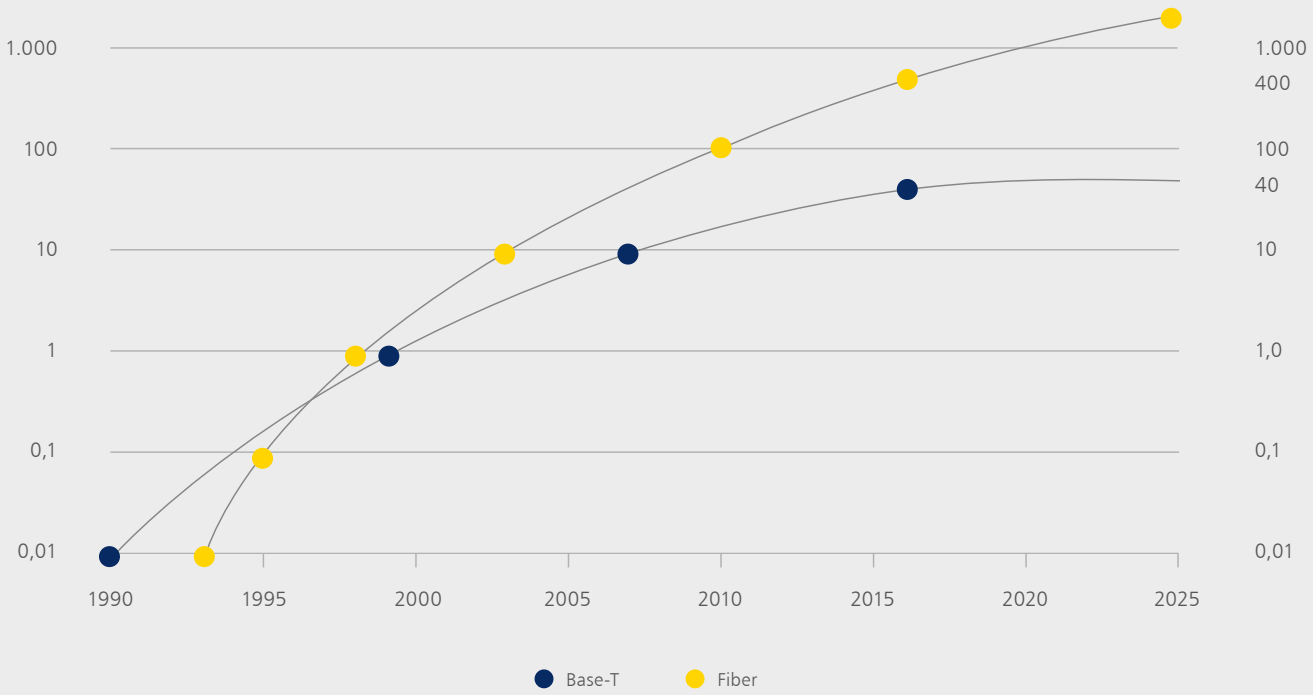
The proper equipment for every application: Whether the requirement is a high transmission performance, electromagnetic compatibility (EMC) or the best fire protection properties - with us you will find the optimum data cable for every application. We will support you in all questions regarding the assembly and installation.

Speed

The demands on modern networks are very high. Speed and transmission characteristics are becoming increasingly important. Gigabit Ethernet thereby offers an enormous potential for the future. Planning certainty is an important factor, because modern cable concepts must also offer room for tomorrow's technical developments. The cables and lines from METZ CONNECT support a future-proof and structured cabling. The product range from Cat.6 over Cat.7 up to Cat.7_A, is tailored to the needs of many applications and allows the highest level of transmission speeds. Our cable series are designed in such a way that cable sharing (mixed operation) in the lower transmission speed class is also possible with every cable. Together with our innovative partner Draka, we can offer you perfectly coordinated cable concepts with a modern perspective - **We realize ideas!**

TYPE	BAND PASSANTE	CLASSE	CATÈGORIE	
MC GC1300	10/25 GBit	F_A	Cat.7_A	
MC GC1000	10 GBit	F	Cat.7	
MC GC600	10 GBit	E_A	Cat.6_A	
MC550	10 GBit	E_A	Cat.6_A	
MC GC400	1 GBit	E	Cat.6	

Development of Ethernet data rates in GBit/s



Important standards for the cabling

STANDARDIZATION			INTERNATIONAL	EUROPE
Generic cabling systems	Part 1	General requirements	ISO/IEC 11801-1	EN 50173-1
	Part 2	Office spaces	ISO/IEC 11801-2	EN 50173-2
	Part 3	Industrial spaces	ISO/IEC 11801-3	EN 50173-3
	Part 4	Homes	ISO/IEC 11801-4	EN 50173-4
	Part 5	Data centre spaces	ISO/IEC 11801-5	EN 50173-5
	Part 6	Distributed building services	ISO/IEC 11801-6	EN 50173-6
Cabling installation	Part 1	Installation specification and Quality assurance	ISO/IEC 14763-2	EN 50174-1
	Part 2	Installation planning and practices inside buildings		EN 50174-2
	Part 3	Installation planning and practices outside buildings		EN 50174-3
Telecommunications bonding networks for buildings and other structures			ISO/IEC 30129	EN 50310

Products and solutions

We provide solutions today. For the innovations of tomorrow.

APPLICATION IN THE LAN - LOCAL AREA NETWORK

Our high-quality cables are always used where a high-speed data transmission in local area net-works (LAN) is required. The cables are thereby used for structured and application neutral networks – Ethernet 100 BaseT, 1000 BaseT and 10 GBit Ethernet. In addition to the voice and data communication applications our solutions are suitable for the remote power supply of various terminal devices through Power over Ethernet (4PPoE up to 100 W) and HighEnd 4K video (e.g. HD-BaseT).

Our product range includes installation and connection cables that have been tested for compatibility with the commercially available connection components. This ensures a maximum degree of operational reliability.

APPLICATION IN THE DATA CENTRE

Every data centre has its own special structure. There are different environments with different requirements, which require the development of customized solutions.

As soon as the change to 10 GBit Ethernet is carried out at the client level, a data centre Backbone which is also designed for 10 GBit Ethernet, will quickly become a bottleneck for the connection between the access and distribution layer. Although distances of up to 100 m at 10 GBit/s, or 30 m at 25 and 40 GBit/s can be achieved with copper data cables, laser-optimized multimode type OM3, OM4 and new OM5 fiber technology offer a significantly higher future proofness today. With OM5 fiber technology it is possible to transmit up to 40 GBit/s permultimode fiber.

40-GBit Ethernet and 200-GBit Ethernet, as well as upcoming up to 1.6-TBit Ethernet – based on multi-lane variants of OM3, OM4 and OM5 connections. A modern infrastructure designed with fiber optic cables according to OM4 or OM5 can thus also be expanded to a 25 GBit fiber Ethernet compatible network and beyond at a later point in time.

Specific to the protected but demanding data centre environment is the demand for a small size and easy installation options. Here, METZ CONNECT can offer new and innovative cables for such high-fiber count applications. These advanced cables are designed for use with the most advanced connection technology on the market. The cables are available in various versions with different fiber types, and thus meet all requirements or high fiber count cabling in the data centre.

INDUSTRIAL APPLICATIONS

The world of office and industrial cabling is converging at an ever-increasing pace. Ethernet is also becoming increasingly established in the field of industrial automation. In addition to the bus solutions that are still in use, however, Ethernet offers the possibility of managing the communication. Selective access to every single point in the network enables the easy performance of adjustments and changes, thus promising low downtimes as well as productivity gains.

Our FO and copper data cables are the right choice for Ethernet applications in harsh industrial environments. This is where the cables are able to demonstrate their advantages in terms of mechanical, chemical and climatic resistance.

EU CONSTRUCTION PRODUCTS DIRECTIVE (BAUPVO)/(CPR)

The new EU Construction Products Directive - in short BauPVo - replaced the previous Construction Products Directive 89/106/EEC (BPR) in July 2013, and has been adopted as a European Directive in all EU member states since July 1, 2017. The aim was to create a common technical language by adopting the standards, which defines uniform product and testing standards through technical specifications. The Construction Product Regulation (CPR) refers to all cables that are manufactured or distributed for the fixed and permanent installation in buildings, and whose performance affects the performance characteristics of the building.

CE marking

Under EU law, only the procedures for proving that a product also fulfils these requirements will be harmonised. The definition of security requirements remains the responsibility of the national authorities.

This means that:

- a declaration of performance for cables (DoP declaration of performance) must be provided
- all affected products are provided with a CE identification marking.
- the conformity with the declaration of performance of the product has been declared with the required information (fire behaviour).

Adoption of the CPR euro classes into the national regulation

An essential component of the CE marking prescribed by law is the indication of fire classes. Cables are assigned to Euroclasses from A_{ca} to F_{ca} according to their fire behaviour, which is tested according to the current EN50399 test standard. Compliance with these test criteria is monitored, and certified by independent institutions, so-called notified bodies.

According to building supervisory requirements and the classification of fire behaviour classes according to DIN EN 13501-6:2014-07, a minimum requirement of class E_{ca} is required in Germany, which means normally flammable. With regard to this requirement, the ZVEI has issued recommendations for the use of the new Euro performance classes. Cables of the classes F_{ca} or D_{ca} are intended for general use, provided no special fire situations are to be expected.

Cables of class $B2_{ca}$ and C_{ca} are provided precisely for situations where it is obviously necessary to increase the level of fire protection (hospitals, kindergartens).

Essential features of the cables under the BauPVo

Performance features of BauPVo are:

- Fire behaviour of building products
- Release of hazardous substances

These support the requirements for the:

- Construction sector
- Hygiene, health, environmental protection

Safety requirements for cables in the event of fire

The construction work must be planned and carried out in such a way, that in the event of a fire:

- the development and spreading of fire and smoke is minimized within the building,
- the spreading of fire is limited to neighbouring buildings
- persons present can leave the construction site, or can be saved by other measures,
- the safety of the rescue teams is considered

Product solutions

ll cables for the building cabling from METZ CONNECT are classified, and the corresponding information according to CPR Euroclasses is stored in the data sheet.

In this context, we will continue to offer new products for high or very high fire protection requirements in the future.

Innovative cable solutions -

for more safety

Fire class $B2_{ca}$
Building with a very high security requirement

Fire class C_{ca}
Building with a high security requirement

Fire class D_{ca}
Building with a medium security requirement

Fire class E_{ca}
Building with a low security requirement

Fire class F_{ca}
for buildings without safety requirements permissible

FIRE BEHAVIOR

For years, flame retardancy has been one of the minimum requirements for indoor cables. PVC cables are often used. Although they are highly fire retardant they will not prevent the fire spreading. They can even release highly corrosive and toxic gases. High-quality LSHF (FRNC) materials with significantly improved properties offer a proven and future-proof alternative to PVC cables in the event of fire.

Protective LSHF sheath

(Low Smoke Halogen Free)

What advantages to halogen-free cables offer?

- In case of fire, no corrosive gases are released, which could cause considerable damage to people and buildings.
- No hydrogen chloride gas which combines with water to form hydrochloric acid is created.
- The share of toxic gases is reduced to minimum, i.e. no irritation of the mucous membranes and the eyes.
- Halogen-free cables are Flame Retardant and have low fire propagation characteristics, which avoids the dreaded fuse effect.
- Through a lack of smoke, escape routes will remain visible for fleeing persons and the fire brigade.

Safety spring

The highest security precautions in cabling apply in places with large accumulations of people, e.g. hospitals, airports, schools, department stores, hotels, in facilities with high concentrations of material assets, and everywhere where an interrupted operation would cause high costs, for example, in Industrial plants, powerplants, EDP centres, banks, power stations, and fundamentally in alarm, signalling, control and monitoring systems.

Proposal of the German cable industry for building class regulations

BUILDING CLASSES ACCORDING TO MBO

EUROCLASSES

CLASS	DESCRIPTION		MINIMUM REQUIREMENT	
			Building	Escape route
1	Free-standing buildings and free-standing agricultural and buildings used for agriculture and forestry	up to 7 m high, with no more than 400 m² in total	E_{ca}	-
2	Building	up to 7 m high, with no more than 400 m² in total	E_{ca}	-
3	Other buildings	up to 7 m high	E_{ca}	
4	Other buildings	up to 13 m high, up to nx400m²	E_{ca}	$B2_{ca}$ s1 d1 a1
5	Other buildings including underground buildings	-	C_{ca} s1 d2 a1	
SPECIAL BUILDINGS				
S1	High-rise buildings	higher than 22 m	C_{ca} s1 d2 a1	
S2	Building facilities	higher than 30 m	C_{ca} s1 d2 a1	
S3	Building	more than 1600 m² largest storey, excluding residential buildings and garages	C_{ca} s1 d2 a1	
S4	Sales outlets	larger than 800 m²	C_{ca} s1 d2 a1	
S5	Office/Administration	Rooms larger than 400 m²	C_{ca} s1 d2 a1	
S6	Building with rooms	Individual rooms Use with more than 100 persons	C_{ca} s1 d2 a1	
S7	Places of assembly	mehr als 200 Personen	C_{ca} s1 d2 a1	$B2_{ca}$ s1 d1 a1
S8	Restaurants/Hotels	more than 40 guest places in buildings, more more than 12 beds, amusement arcades more than 150 m²	C_{ca} s1 d2 a1	
S9	Buildings with usage units for care or people in need of care	more than 6 people, intensive care needs	$B2_{ca}$ s1 d1 a1	
S10	Hospitals			
S11	Other facilities for the accommodation of persons and hostels		C_{ca} s1 d2 a1	
S12	Day care centers for children, disabled and elderly people		$B2_{ca}$ s1 d1 a1	
S13	Schools, universities and similar institutions		C_{ca} s1 d2 a1	$B2_{ca}$ s1 d1 a1
S14	Correctional facilities and structural facilities for for the penal system		C_{ca} s1 d2 a1	
S16	Leisure/amusement parks		C_{ca} s1 d2 a1	$B2_{ca}$ s1 d1 a1
S18	Rack storage with top edge of load higher than 7.5 m		E_{ca}	
S19	Structural installations for the storage of substances with increased fire risk		$B2_{ca}$ s1 d1 a1	
FURTHER ALLOCATION BY THE CABLE INDUSTRY				
	Infrastructure building		C_{ca} s1 d2 a1	
	Server rooms		$B2_{ca}$ s1 d1 a1	
	Road tunnel		$B2_{ca}$ s1 d1 a1	$B2_{ca}$ s1 d1 a1
	Railroad tunnel		$B2_{ca}$ s1 d1 a1	
	Underground garages		C_{ca} s1 d2 a1	

Furthermore, these recommendations have been adopted in the following standardizations:
- DIN EN 50174 Parts 2 and 3 (VDE 0800-174 Parts 2 and 3)
- DIN VDE V 0250-10 V (VDE V 0250-10)

Notes

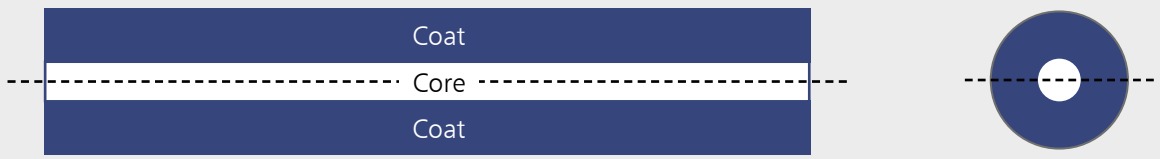
FIBER OPTIC

Fiber science

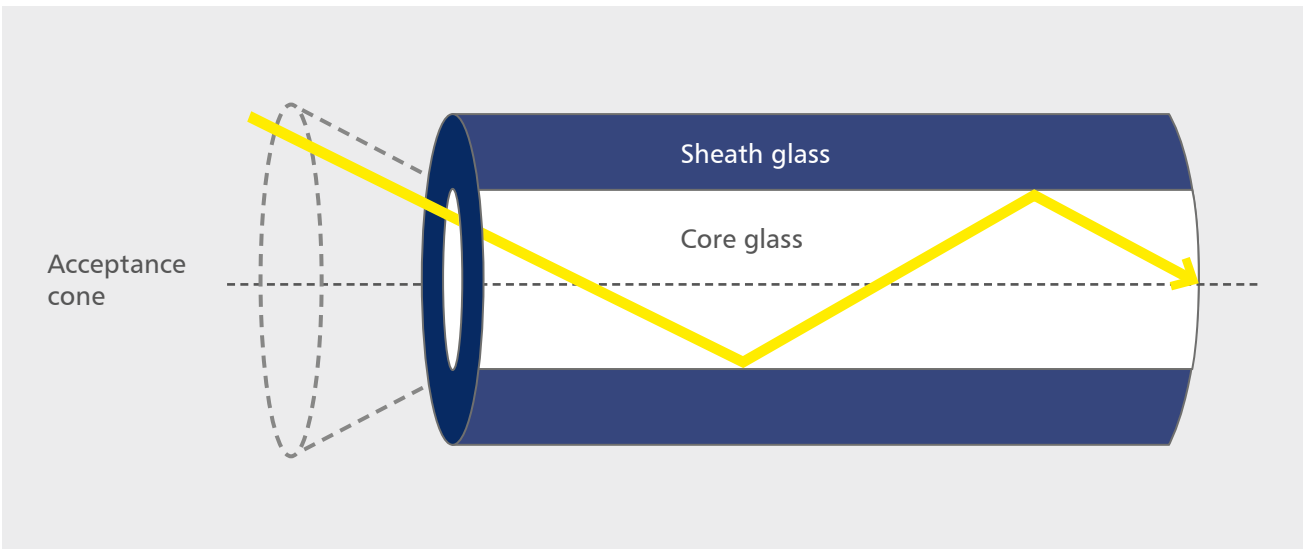
The variety of applications, different requirements and continuously growing data volumes have led to the ongoing development of different fiber optic types. The main differences and properties of these types are described below.

Basics

Signal propagation in the optical waveguide is based on the principle of total reflection. This means that a light beam can be totally reflected at the transition from an optically denser medium to an optically thinner medium depending on its angle of incidence. For this reason, the basic structure of fiber optic cables consists of an optically dense core and an optically thinner cladding.



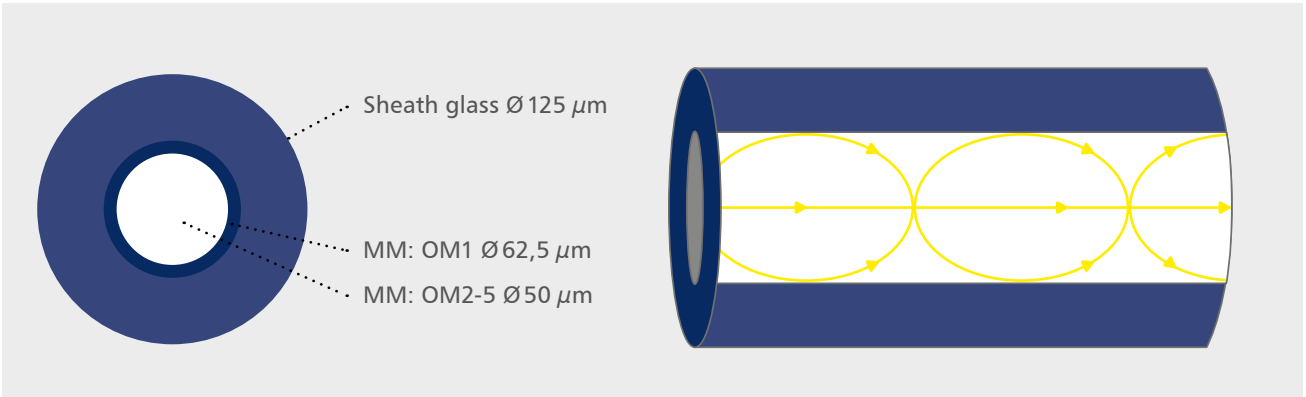
The design of the optical fibers is such that the light, when introduced at a specific angle, is continuously totally reflected and thus propagates along the fiber. This specific area where the light is successfully coupled in is called the „acceptance cone".



Multimode fiber (MMF)

With multimode fibers, several light waves or modes are used to transmit signals. The large core diameter of the fiber of 50 µm or 62.5 µm enables the propagation of several different modes and allows the use of technically simpler and, above all, less expensive light sources.

Despite the optimized beam path due to the adjustment of the refractive index in the fiber, the gradient profile the large number of modes quickly leads to propagation time differences and overlapping of the signals, so multimode fibers are mainly used for short transmission distances.



For transmission with multimode fibers, the wavelength 850 nm or 1300 nm are typically used.

OM1 (62,5/125 µm)

The OM1 fiber has been on the market for a long time and is often found in older network structures. Light is transmitted with the help of an LED and only limited transmission distances are possible due to the larger core diameter of 62.5 µm. It is important to note that OM1 fiber is not compatible with other multimode fibers. Typically, the OM1 fiber is characterized by a gray cladding.

OM2 (50/125 µm)

OM2 fibers also use LED light as the light source. Due to their smaller core diameter of 50 µm, longer transmission distances are possible with OM2 than with OM1. The OM2 fiber is usually characterized by an orange colored cladding.

OM3 (50/125 µm)

OM3 fibers are among the most widely used multimode fibers. Continuous optimization of the manufacturing processes has improved the quality of the quartz glass, resulting in better transmission properties. OM3 fibers are excited by narrowband light sources, such as VCSEL lasers. The cladding of the OM3 fiber is aqua in color. Another advantage is the upward compatibility of OM3 fibers with OM4 and OM5 fiber types.

OM4 (50/125 µm)

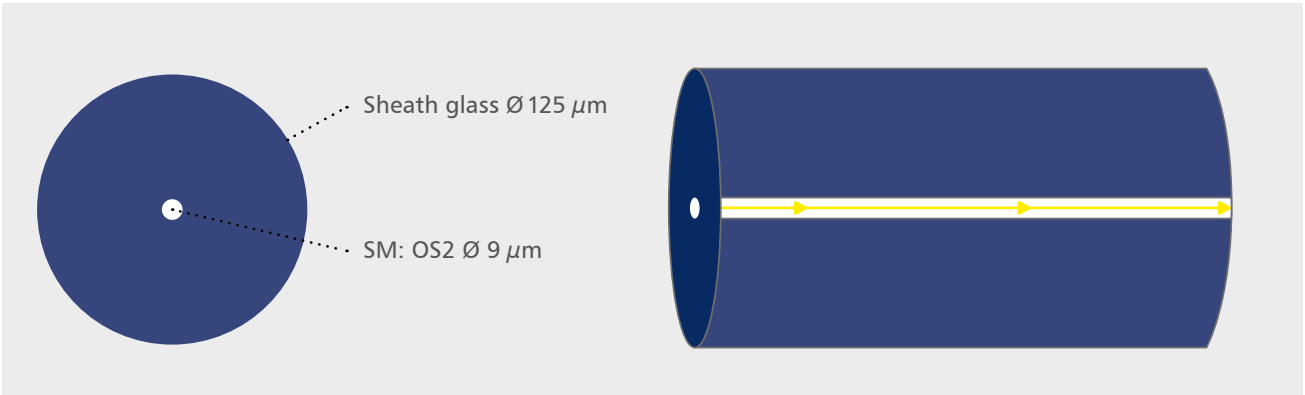
OM4 fibers are essentially characterized by improved transmission distances, which are achieved by particularly pure and constant manufacturing processes. The OM4 fiber also uses a laser light source and is characterized by a violet cladding. It is also compatible with OM3 and OM5 fiber types.

OM5 (50/125 µm)

The OM5 fiber was developed to meet the increasing data volumes. Unlike other multimode fibers, the OM5 fiber does not transmit a single wavelength, but uses wavelength multiplexing to simultaneously transmit four waves in the 850 - 950 nm range. This makes it possible to transmit four times the amount of data. The OM5 fibers are characterized by their lime green cladding.OM5 fibers have a fiber green cladding.

Singlemode fibers (SMF)

In contrast to multimode fibers, only one mode is used for transmission in the singlemode range. For this purpose, the diameter of the fiber core was reduced and is only 9 µm for SMF. Since propagation time differences and signal overlaps do not occur until very late in the transmission of a single mode, SMF makes it possible to transmit data over long distances. Due to the small fiber core and the low acceptance cone, highly efficient lasers are required as light sources for singlemode fibers, and these are more expensive than the light sources for multimode fibers.



Wavelengths of 1310 nm, 1550 nm or 1625 nm are typically used for transmission with single-mode fibers.

OS2 (9/125 µm)

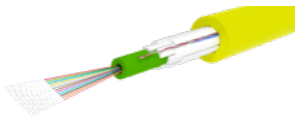
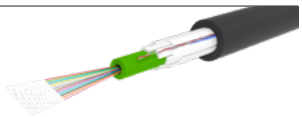
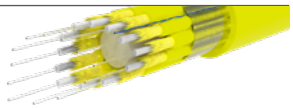
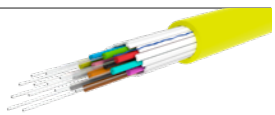
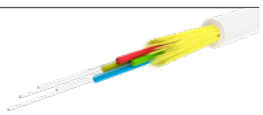
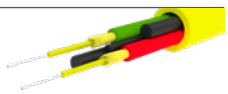
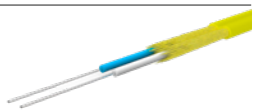
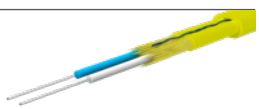
In contrast to multimode fibers, only a single mode is used for transmission in the singlemode range. For this purpose, the fiber core was reduced to a diameter of only 9 µm. This reduction means that propagation time differences and signal overlaps do not occur until very late in transmission with a single mode. This makes it possible to transmit data over long distances with high efficiency. However, due to their small fiber core and low acceptance cone, single-mode fibers require high-quality lasers as a light source, which are generally more expensive than the light sources for multimode fibers.

Maximum reaches

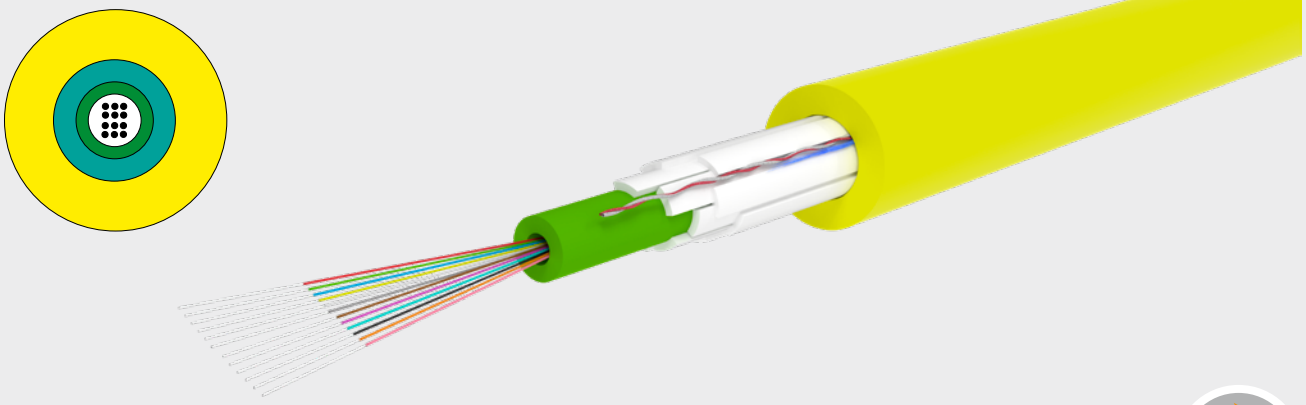
These are approximate figures, they may differ from fiber manufacturer to fiber manufacturer.

FIBER TYPE		MULTIMODE FIBER					SINGLEMODE FIBER
		OM1	OM2	OM3	OM4	OM5	OS2
Core diameter		62.5 µm			50 µm		9 µm
Sheath color		orange	orange	aqua	heather violet	lime green	yellow
Maximum range	1000 Base-SX	500 m	750 m	900 m	1.000 m	1.100 m	-
	1000 Base-LX	1.000 m	2.000 m	550 m	550 m	550 m	5000 m
	10GBASE-LX4	450 m	700 m	300 m	300 m	300 m	10.000 m
	10GBASE-SR	65 m	150 m	300 m	550 m	550 m	
	10G BASE ER	-	-	-	-	-	40.000 m
	40GBASE-SR4	-	-	100 m	150 m	190 m	
	40GBASE-LR4	-	-	-	-	-	10.000 m
	40GBASE-SWDM4	-	-	-	-	300 m	-
	100GBASE-SR4	-	-	-	-	100 m	-
	100GBASE-LR4	-	-	-	-	-	10.000 m
	100GBASE-SR10	-	-	100 m	150 m	190 m	-
	100GBASE-ER4	-	-	-	-	-	40.000 m
	100GBASE-SWDM4	-	-	-	-	300 m	-

Cable overview

CABLE ASSEMBLY	CABLE TYPE		NUMBER OF FIBERS	SITE
	OpDAT Universal Cable	U-DQ(ZN)BH	4, 8, 12, 24, 48	15
	OpDAT Outdoor Cable	A-DQ(ZN)B2Y	4, 12, 24, 48	16
	OpDAT Breakout Cable	I-V(ZN)HH	2, 4, 8, 12, 24	17
	OpDAT Mini Breakout Cable	U-VQ(ZN)H	2, 4, 12, 24	18
	OpDAT Mini Breakout Cable Compact	I-VQ(ZN)H	4	19
	OpDAT FITH-Cable	I-MH(ZN)H	4	20
	OpDAT Industrial Cable	I-V(ZN)Y11Y	2	21
SHUNTING CABLE				
	OpDAT Simplex Patch Cable	I-V(ZN)H	1	22
	OpDAT FITH Patch Cable	I-V(ZN)H (weiß)	1	23
	OpDAT Duplex Patch Cable	I-V(ZN)H	2	24
	OpDAT Connecting Cable	I-V(ZN)HH	2	25

Installation cable



OpDAT Universal Cable | U-DQ(ZN)BH

These cables have been designed for indoor and outdoor use. The universal cables have an LSHF or LSHF-FR covering making them ideal for indoor use with limited requirements for flame propagation. All fibers are bend-insensitive.

Cable design

Cable with gel-filled bundle tube. Coated glass rovings guarantee a sufficiently high tensile strength and a certain rodent protection. The cable has a FireBur® LSHF jacket and is longitudinally watertight.

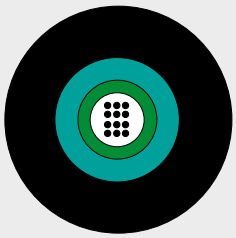
Areas of application

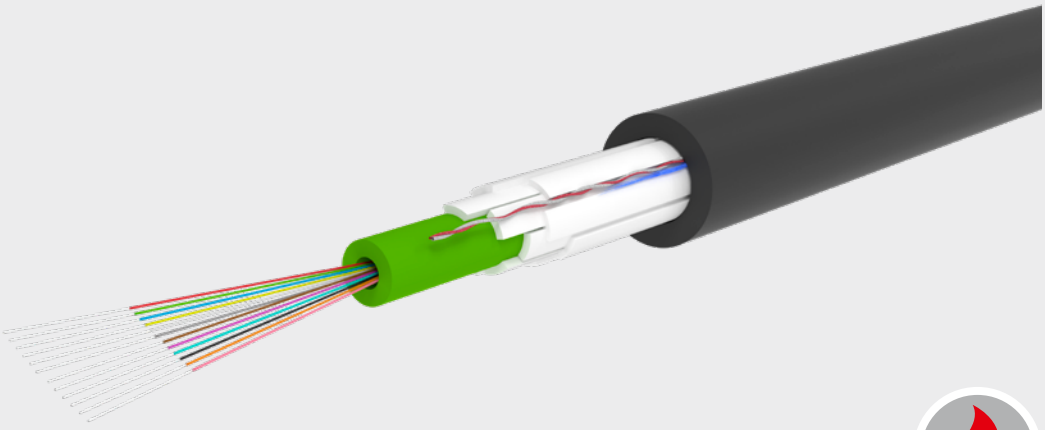
Suitable for medium to long distances in the LAN backbone, where robust and compact cables with medium compressive strength are required. The cable is suitable for installation in cable conduits, protection tubes and tunnels. For outdoor use, the installation in a sand bed or in protective pipes is recommended.

CHARACTERISTICS

Number of bundles/fibers		1 x 4, 1 x 8, 1 x 12, 1 x 24	4 x 12
Cable diameter (mm)		7.5	13.0
Weight (kg/km)		55	105
max. Tensile strength during the installation (N)		3000	6000
smallest bending radius during the operation (mm)		150	224
Transverse compressive strength (N/dm)		3500	3000
Temperature range during the operation (°C)		-30 to +70	-40 to +70
Color Cable sheath	OM3		aqua
	OM4		violet
	OM5		lime green
	OS2		yellow

Outdoor cable





OpDAT Outdoor Cable

These cables are specially designed for outdoor use. The black LLDPE jacket is UV resistant and provides high mechanical protection. The cable can be used for direct burial.

Cable design

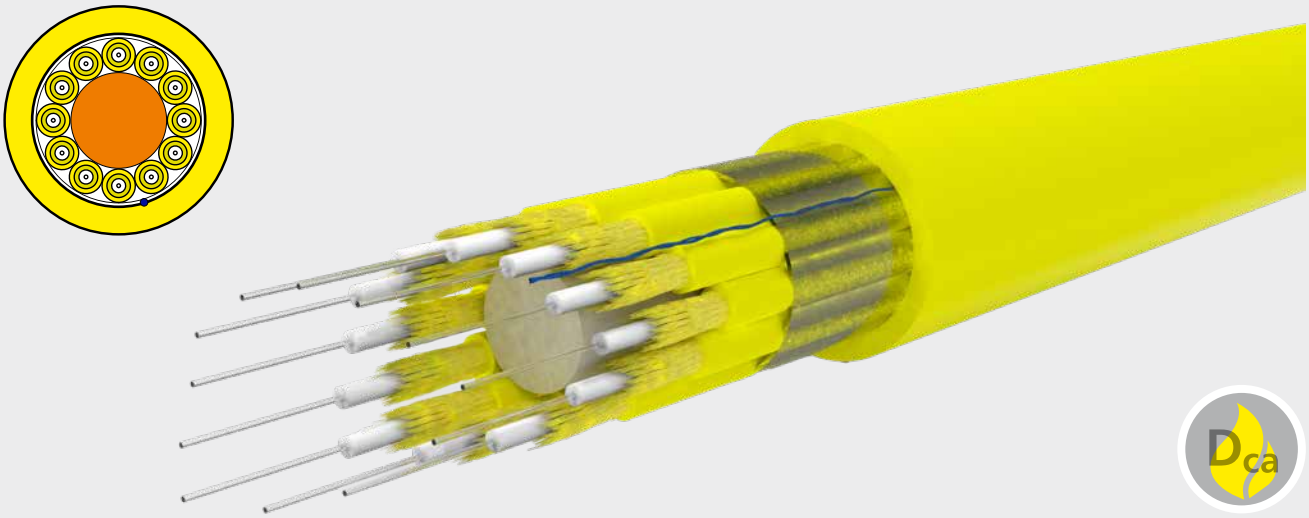
Cable with gel-filled loose tube. Jacketed glass rovings ensure high tensile strength. The cable is longitudinally watertight, metal-free and rodent-proof.

Areas of application

Suitable for medium to long distances in the LAN backbone. Outdoor cables may only be used indoors in compliance with fire protection regulations.

CHARACTERISTICS		
Number of bundles/fibers	1 x 4, 1 x 12, 1 x 24	4 x 12
Cable diameter (mm)	7.0	11.0
Weight (kg/km)	40	103
Max. Tensile strength during the installation (N)	3000	5000
Smallest bending radius during the operation (mm)	140	190
Transverse compressive strength (N/dm)	2000	3000
Temperature range during the operation (°C)	-30 to +70	-40 to +70
Color - Cable sheath		black

Installation cable



OpDAT Breakout Cable | I-V(ZN)HH

Breakout cables are designed for indoor use. They have an LSHF-FR outer sheath. For risers and as distribution cables, the individual cables can be split individually by opening the common cable sheath. The cables are UV-resistant, metal-free, water and moisture-resistant. All fibers used are bend-insensitive.

Cable design

Single cable with full cores and aramid strain relief for the direct assembly of FO connectors.

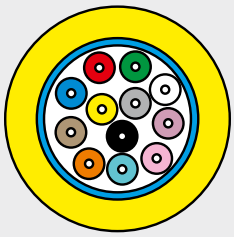
Areas of application

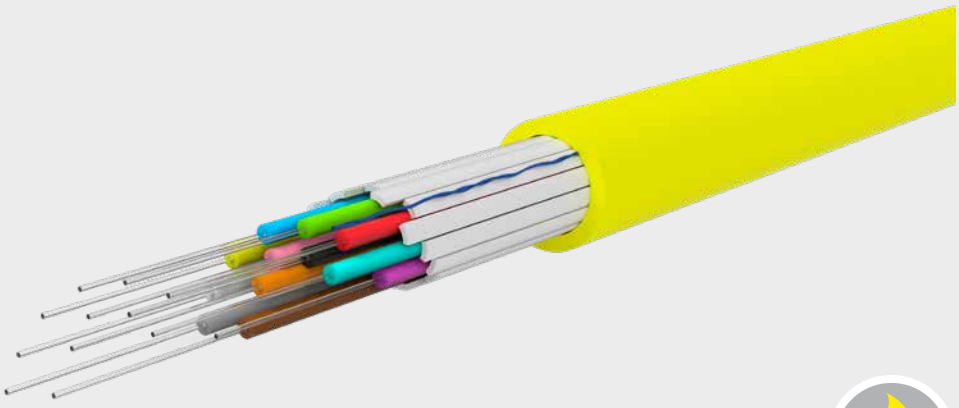
They are primarily intended for the laying in pipes, cable trays and cable ducts indoors, but can also be used outdoors.

CHARACTERISTICS

Number of fibers		4	8	12	24
Cable diameter (mm)		7.5	10	12.5	14.5
Weight (kg/km)		60	100	160	210
Max. Tensile strength during the installation (N)		1300	2400	3500	4500
Smallest bending radius during the operation (mm)		75	100	150	175
Transverse compressive strength (N/mm)					1 500 / 100
Temperature range during the operation (°C)					-20 to +70
Color - Cable sheath	OM3				aqua
	OM4				violet
	OM5				lime green
	OS2				yellow

Installation cable





OpDAT Mini Breakout Cable | U-VQ(ZN)H

Mini-breakout cables are mainly designed for indoor use. They have an LSHF-FR outer sheath. The cables are UV-resistant, metal-free, water and moisture-resistant. All fibers inside are bend-insensitive.

Cable design

The cables with tight buffered fibers and glasroving elements as a strain relief have a flame retardant, halogen free outer sheath. A waterproof layer of coated glass rovings gives the cable the necessary tensile strength. The cable is equipped with a FireRes®-LSHF-FR jacket.

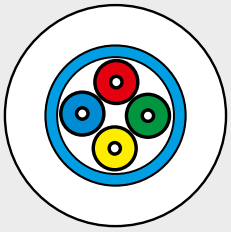
Areas of application

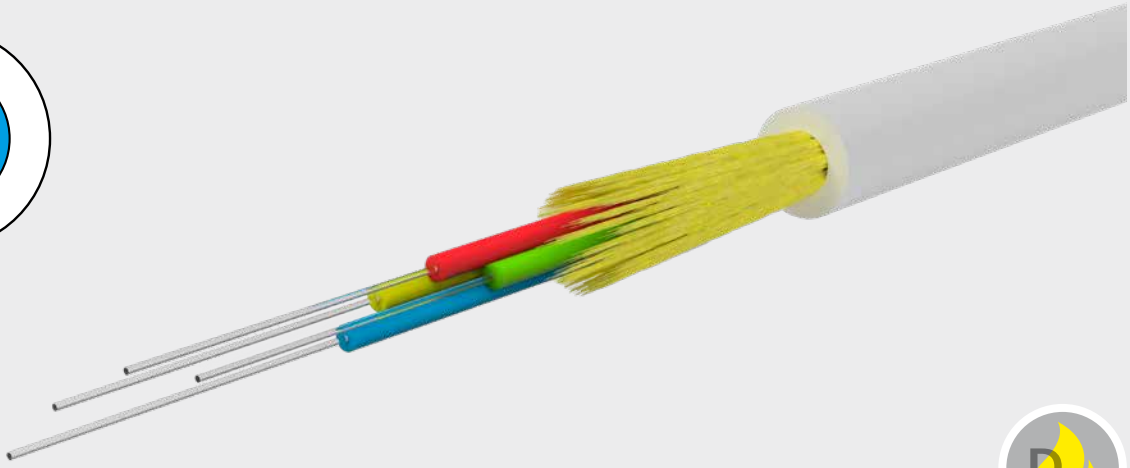
Possible applications are short distance connections, backbone and distribution cabling. They are primarily intended for the laying in pipes, cable trays and cable ducts indoors, but can also be used outdoors.

CHARACTERISTICS

Number of fibers		2	4	12	24
Cable diameter (mm)		4.6	5.2	7.0	8.5
Weight (kg/km)		19	27	48	73
Max. Tensile strength during the installation (N)		325	440	900	1400
Smallest bending radius during the operation (mm)		50	50	50	60
Transverse compressive strength (N/dm)					2000
Temperature range during the operation (°C)					-40 to +70
Color - Cable sheath	OM3				aqua
	OM4				violet
	OM5				lime green
	OS2				yellow

Installation cable





OpDAT Mini Breakout Cable Compact | I-VQ(ZN)H

The indoor cable intended for the FITH range blends inconspicuously into the living area with its white cable sheath. Due to its diameter of 4.5mm it is very compact and offers sufficient stability under mechanical loads.

Cable design

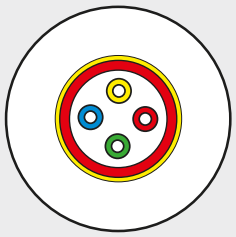
The cable contains 4 coloured semitight buffered fibers (Ø 0.9 mm) and aramid yarn for strain relief. The cable sheath is halogen free with a low smoke emission and self-extinguishing properties.

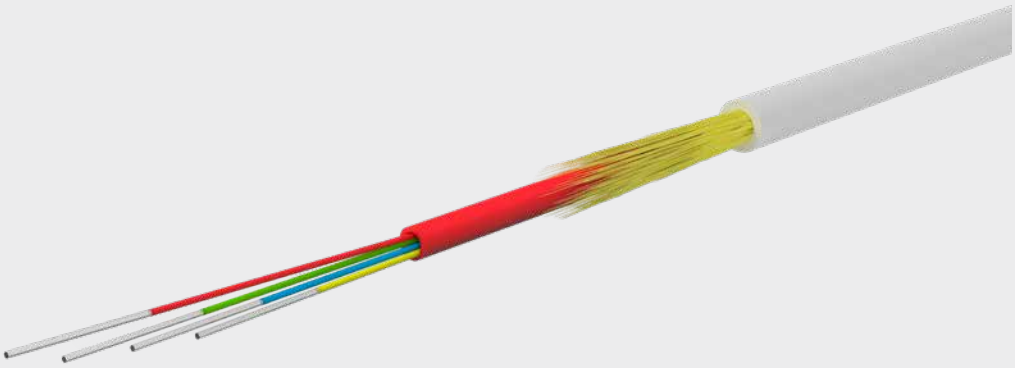
Areas of application

Typical application is the cabling in the building (Fiber-in-the-Home) as a continuation of the fiber from the house transfer point of the FTTH network (Fiber-to-the-Home).

CHARACTERISTICS		
Number of fibers		4
Cable diameter (mm)		4.5
Weight (kg/km)		21
Max. Tensile strength during the installation (N)		1000
Smallest bending radius during the operation (mm)		10
Transverse compressive strength (N/mm)		3000 / 100
Temperature range during the operation (°C)		-40 to +70
Color - Cable sheath	OS2	white

Installation cable





OpDAT FITH-Cable | I-MH(ZN)H

Indoor cable for the FITH area. The compact cable design is very well suited for retrofitting the cable into existing structures. The core is easy to set down and can be spliced very well.

Cable design

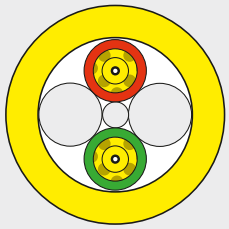
Compact cable construction with 2.3 mm diameter. The cable sheath is halogen-free, self-extinguishing and fire retardant. The 4 fibers are bundled in a central element and have a diameter of 250μm each.

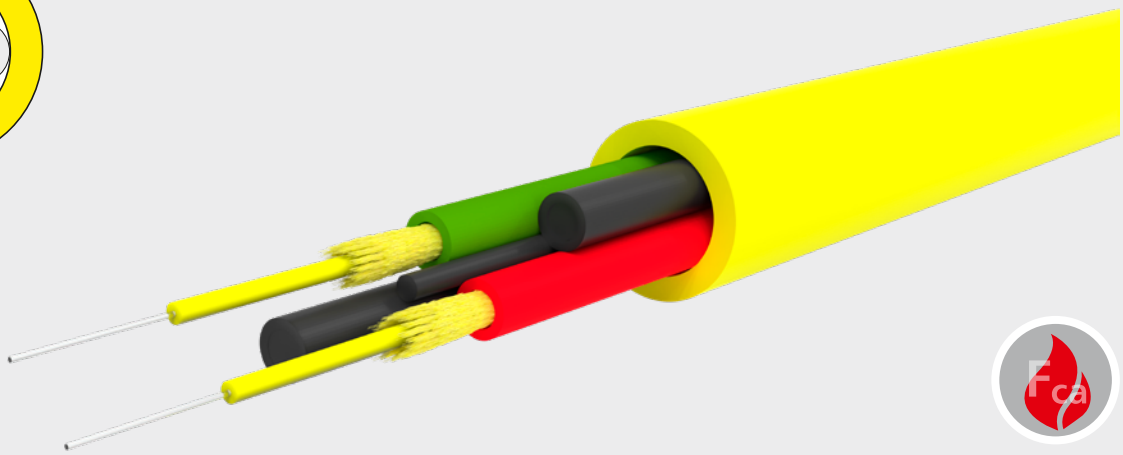
Areas of application

The cable can be laid in cable ducts or pulled into empty conduits. The cable can be blown in.

CHARACTERISTICS		
Number of bundles/fibers		4
Cable diameter (mm)		2.3
Weight (kg/km)		5.2
Max. Tensile strength during the installation (N)		400
Smallest bending radius during the operation (mm)		10
Transverse compressive strength (N/mm)		1000 / 100
Temperature range during the operation (°C)		-10 to +60
Color - Cable sheath	OS2	white

Installation cable





OpDAT Industrial Cable | I-V(ZN)Y11Y

Indoor cable for industrial use. The cable sheath has a high abrasion resistance, is chemically resistant, oil-, ozone-, UV- and water-repellent resistant.

Cable design

Two individual cables with strain relief elements, enclosed within a common outer covering, duplex cable with excellent abrasion and chemical resistance for connecting or shunting cables; resistant to UV radiation, oil and ozone. Watertight.

Areas of application

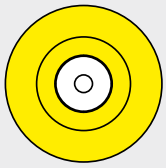
For use in industrial applications.

Please note that the cable is not intended for use as bulk cable and should be used only with connectors.

CHARACTERISTICS

Number of bundles/fibers		2
Cable diameter (mm)		9.40
Weight (kg/km)		approximately 80
Max. Tensile strength during the installation (N)		600
Smallest bending radius during the operation (mm)		94
Transverse compressive strength (N/dm)		1000
Temperature range during the operation (°C)		-10 to +70
Color - Cable sheath	OM3	orange
	OS2	yellow

Shunting cable



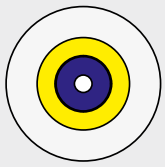
OpDAT Simplex Patch Cable | I-V(ZN)H

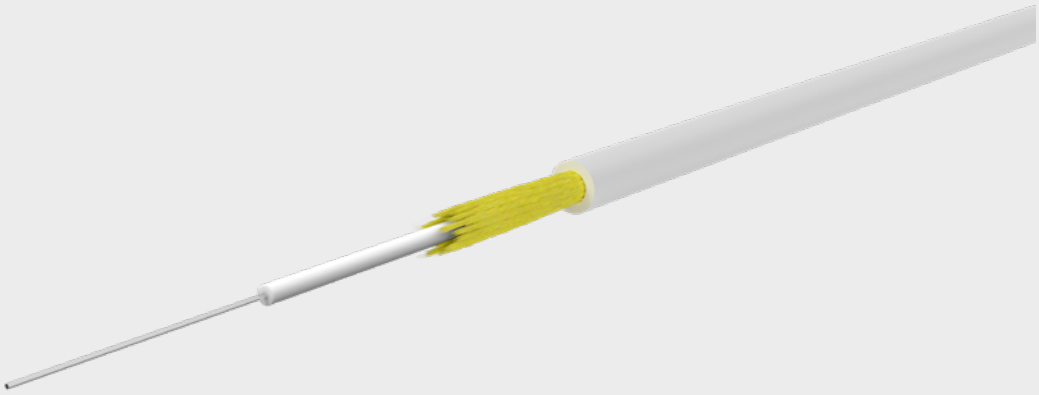
Single-fiber cable with Ø 2mm and a 900 μm solid core that is strain-relieved by aramid yarn. The sheath is halogen-free and flame retardant. The cable is very well suited for connector assembly. The singlemode fiber is according to ITU-T G.657.A2 and compatible to G.652.D

CHARACTERISTICS

Number of bundles/fibers		1
Cable diameter (mm)		2.0
Weight (kg/km)		8
Max. Tensile strength during the installation (N)		60
Smallest bending radius during the operation (mm)		20
Transverse compressive strength (N/dm)		100
Temperature range during the operation (°C)		-20 to +60
Color - Cable sheath	OS2	yellow

Shunting cable





OpDAT FITH Patch Cable | I-V(ZN)H

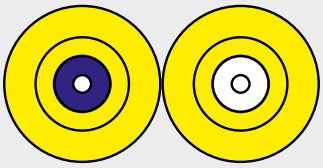
Single-fiber cable with Ø 2.8 mm and a 900μm solid core that is strain-relieved by aramid yarn. The white outer jacket is halogen-free and flame-retardant. The cable is very suitable for connector assembly.

The singlemode fiber is according to ITU-T G.657.A2 and compatible to G.652.D.

CHARACTERISTICS

Number of bundles/fibers		1
Cable diameter (mm)		2.8
Weight (kg/km)		9
Max. Tensile strength during the installation (N)		300
Smallest bending radius during the operation (mm)		7.5
Transverse compressive strength (N/dm)		3000
Temperature range during the operation (°C)		-40 to +70
Color - Cable sheath	OS2	white

Shunting cable



OpDAT Duplex Patch Cable | I-V(ZN)H

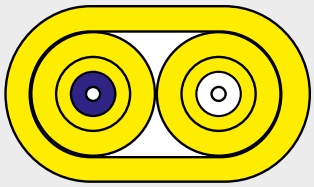
Two-fiber cable with 4 x2 mm and two 900 μm solid conductors which are strain-relieved by aramid yarn. The outer sheath is halogen-free and flame retardant. The cable is very suitable for connector assembly.

All fibers are insensitive to bending. The singlemode fiber is according to ITU-T G.657.A2 and compatible to G.652.D.

CHARACTERISTICS

Number of bundles/fibers		1
Cable diameter (mm)		4.0 x 2.0
Weight (kg/km)		8
Max. Tensile strength during the installation (N)		150
Smallest bending radius during the operation (mm)		20
Transverse compressive strength (N/dm)		3000
Temperature range during the operation (°C)		+30 to +60
Color - Cable sheath	OM3	aqua
	OM4	violet
	OM5	lime green
	OS2	yellow

Shunting cable



OpDAT Connecting Cable | I-V(ZN)H

Two Ø 2 mm cables with a common outer sheath and one 900μm solid core each which are strain-relieved by aramid yarn. The outer sheath is halogen free and flame retardant. The cable is very suitable for connector assembly.

All fibers are insensitive to bending. The singlemode fiber is according to ITU-T G.657.A2 and compatible to G.652.D.

CHARACTERISTICS

Number of bundles/fibers		1
Cable diameter (mm)		5.0 x 2.0
Weight (kg/km)		18
Max. Tensile strength during the installation (N)		120
Smallest bending radius during the operation (mm)		20
Transverse compressive strength (N/dm)		4000
Temperature range during the operation (°C)		+30 to +60
Color - Cable sheath	OM3	aqua
	OM4	violet
	OM5	lime green
	OS2	yellow

Product overview OpDAT cables

MODE TYPE OF THE FIBER	FIBER CLASS	NUMBER OF FIBERS	SPLITTING	COLOR	P/N
Universal Cable	OM3	4	1 x 4	aqua	150U0045E120M
		8	1 x 8	aqua	150U0085E120M
		12	1 x 12	aqua	150U0125E120M
		24	1 x 24	aqua	150U0245E240M
		48	4 x 12	aqua	150U0485E120M
	OM4	4	1 x 4	violet	150U0047E120M
		8	1 x 8	violet	150U0087E120M
		12	1 x 12	violet	150U0127E120M
		24	1 x 24	violet	150U0247E240M
		48	4 x 12	violet	150U0487E120M
	OM5	4	1 x 4	lime green	150U0048E120M
		8	1 x 8	lime green	150U0088E120M
		12	1 x 12	lime green	150U0128E120M
		24	1 x 24	lime green	150U0248E240M
		48	4 x 12	lime green	150U0488E120M
	OS2	4	1 x 4	yellow	150U0049E120M
		8	1 x 8	yellow	150U0089E120M
		12	1 x 12	yellow	150U0129E120M
		24	1 x 24	yellow	150U0249E240M
		48	4 x 12	yellow	150U0489E120M
Outdoor Cable	OM3	4	1 x 4	black	150A00450120M
		12	1 x 12	black	150A01250120M
		24	1 x 24	black	150A02450240M
	OM4	4	1 x 4	black	150A00470120M
		12	1 x 12	black	150A01270120M
		24	1 x 24	black	150A02470240M
	OS2	4	1 x 4	black	150A00490120M
		12	1 x 12	black	150A01290120M
		24	1 x 24	black	150A02490240M
		48	1 x 48	black	150A04890120M

Product overview OpDAT cables

MODE TYPE OF THE FIBER	FIBER CLASS	NUMBER OF FIBERS	SPLITTING	COLOR	P/N
Breakout Cable	OM3	4	4 x 1	aqua	150B0045D010M
		8	8 x 1	aqua	150B0085D010M
		12	12 x 1	aqua	150B0125D010M
		24	24 x 1	aqua	150B0245D010M
	OM4	4	4 x 1	violet	150B0047D010M
		8	8 x 1	violet	150B0087D010M
		12	12 x 1	violet	150B0127D010M
		24	24 x 1	violet	150B0247D010M
	OM5	4	4 x 1	lime green	150B0048D010M
		8	8 x 1	lime green	150B0088D010M
		12	12 x 1	lime green	150B0128D010M
	OS2	4	4 x 1	yellow	150B0049D010M
		8	8 x 1	yellow	150B0089D010M
		12	12 x 1	yellow	150B0129D010M
		24	24 x 1	yellow	150B0249D010M
Mini Breakout Cable	OM3	4	4 x 1	aqua	150B0085D010M
		12	12 x 1	aqua	150B0125D010M
		24	24 x 1	aqua	150B0245D010M
	OM4	2	2 x 1	violet	150B0047D010M
		4	4 x 1	violet	150B0087D010M
		12	12 x 1	violet	150B0127D010M
		24	24 x 1	violet	150B0247D010M
	OM5	4	4 x 1	lime green	150B0088D010M
		12	12 x 1	lime green	150B0128D010M
		24	24 x 1	lime green	150B0248D010M
	OS2	2	2 x 1	yellow	150B0049D010M
		4	4 x 1	yellow	150B0089D010M
		12	12 x 1	yellow	150B0129D010M
		24	24 x 1	yellow	150B0249D010M
Mini Breakout Cable Compact	OS2	4	4 x 1	white	150C0049D010M
FITH Cable	OS2	4	1 x 4	white	150F0049B040M
Industry Cable	OM3	2	1 x 2	aqua	150I00250010M
	OS2	2	1 x 2	yellow	150I00290010M

Product overview

All patch cords are available in the following lengths

- 20 m supplied as a cable ring in a cardboard box
- 50 m on a cardboard drum
- 100 m on a cardboard drum

OpDAT Simplex Patch Cord | I-V(ZN)H

FIBER TYPE	LENGTH	P/N
	20 m	150P300020M
OS2	50 m	150P300050M
	100 m	150P300100M

OpDAT Simplex Patch Cord FITH | I-V(ZN)H

FIBER TYPE	LENGTH	P/N
	20 m	150P700020M
OS2	50 m	150P700050M
	100 m	150P700100M

OpDAT Duplex Patch Cord | I-V(ZN)H

FIBER TYPE	LENGTH	P/N
	20 m	150J1D0020M
OM3	50 m	150J1D0050M
	100 m	150J1D0100M
	20 m	150S100020M
OM4	50 m	150S100050M
	100 m	150S100100M
	20 m	150R1D0020M
OM5	50 m	150R1D0050M
	100 m	150R1D0100M
	20 m	150P100020M
OS2	50 m	150P100050M
	100 m	150P100100M

OpDAT Connecting Cable | I-V(ZN)H(ZN)H

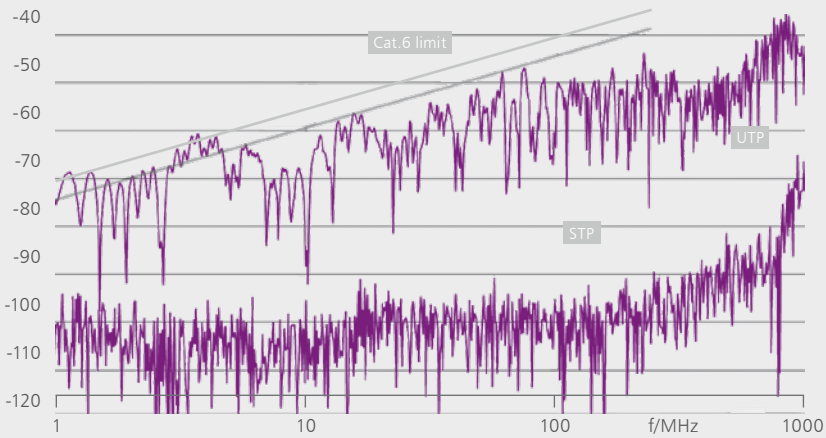
FIBER TYPE	LENGTH	P/N
OM3	20 m	150J1D0020M
	50 m	150J1D0050M
	100 m	150J1D0100M
OM4	20 m	150S100020M
	50 m	150S100050M
	100 m	150S100100M
OM5	20 m	150R1D0020M
	50 m	150R1D0050M
	100 m	150R1D0100M
OS2	20 m	150P100020M
	50 m	150P100050M
	100 m	150P100100M

COPPER

Future-proof cabling

10 GBit Ethernet is the next higher protocol after 1000BaseT and is 10 times faster, has a higher bandwidth and a higher performance. Transmission to 10 GBit Ethernet is based on "full duplex operation" - i.e. over all pairs of a cable simultaneously in both directions (bi-directional) with transmission rates of 2.5 GBit per pair. In addition to the transmission parameters known from 1 Gb Ethernet, cables that are to be suitable for this must also comply with the "Alien-Crosstalk" properties.

Alien Crosstalk requires shielding



Alien (Exogenious) Crosstalk

Alien Crosstalk is the interference of the transmitted signal through superimposition with the noise that is coupled in from all surrounding lines by a larger outside diameter of the sheath. A larger distance between the lines through a larger sheathing diameter actually creates an interference level reduction for U/UTP cables, so that the test criteria are almost fulfilled.

Error detection

Ethernet works on the basis of an error detection system. The recipient will continue to request data packets until the transmission is completed without errors. In the event of a malfunctioning system, the same information is retransmitted, which slows down the transmission: At a certain level of interference, the transmission will collapse. 10Gb Ethernet has the lowest reserves of all Ethernet processes. As a result, high quality components are required.

System reserves

The aim of the cabling standards is to ensure a problem free interaction of the individual components through defined system reserves. This will enable a plug-and-play for up to 100 m of cabling with standardized components. With 10 GBit Ethernet, this system reserve will continue to be available if the components are well matched to each other. With an increasing bandwidth the noise also increases, independent of the components used. The system reserves defined in cabling standards such as TIA represent the minimum of what is necessary for the minimum operational safety.

Shielding

A method for improving the system reserve is based on shielding. The coupling of Alien-Cross-talk can be completely suppressed by shielding the involved components. The proven and patented film wrapping process produces the high-quality degree of shielding required for this. With this product selection, the testing for Alien-Crosstalk is obsolete, which is also confirmed by the cabling standard.

Signal Delay and Time Differences

Due to increased demands on Gigabit-Ethernet the importance of signal delay (delay) and of the delay time differences (skew) are also increasing. The time difference is the transmission difference between the transmission times of two or more pairs.

Transmission safety

Data transmissions are becoming increasingly susceptible to interference due to high data rates. Insufficient cable quality creates additional sources of interference and increases the risk of transmission errors. Despite the high-speed protocol, available data rates are not fully exploited and the performance of the network remains unutilized. You should therefore rely on high-quality data cables with a minimized susceptibility to interference. Invest into the future-proof performance of your network.

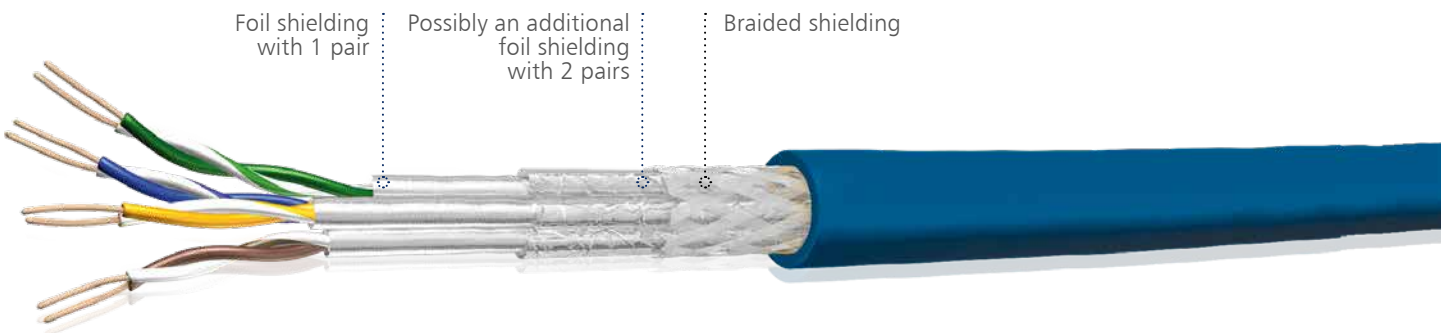
EMC - Electromagnetic compatibility

EMC defines the ability of a device to function satisfactorily in an electromagnetic environment without exerting a negative influence (interference radiation) on other systems. The main problem are malfunctions that affect your own system from the outside and thus cause a system failure, for example. The network environment contains various potential high-frequency interference sources in the frequency range from 80.0 MHz to 2.0 GHz, such as mobile radio, stationary radio or television broadcast transmitters, hand-held radiotelephones and industrial RF sources. The use of high-quality shielded cables omits subsequent adjustments for retrofit installations.

Shielding classes for Copper cabling

The assessment of the effect of shielding and non-shielding requires measurement variables that allow a representative comparison. The use of high-quality materials and the degree of shielding are decisive for an optimal shielding.

In IEC 61156-5, the parameters coupling loss and coupling resistance were defined as shielding characteristics. IEC 61156-5 distinguishes the coupling resistance in grade 1 (PiMF with braiding) and grade 2 (PiMF). However, many users find it too abstract. Especially for the requirements of structured cabling, the characteristic coupling loss was defined in IEC 62153-4-5, which defines a combination of the shielding effect (if present) and the electrical symmetry of the line circuits. Coupling attenuation can thus be regarded as an application-oriented simulation of the network operation.



CABLE HARNESS DESIGN			COUPLING RESISTANCE		COUPLING LOSS 30 MHz - 100 MHz
S/FTP	Grade 1: f/MHz	1 10 30 100	RK/mΩ/m	10 10 30 60	Type 1: 85 dB
U/FTP	Grade 2: f/MHz	1 10 30 100	RK/mΩ/m	50 100 200 1000	Type 2: 55 dB
U/UTP		n/a		n/a	Type 3: 40 dB

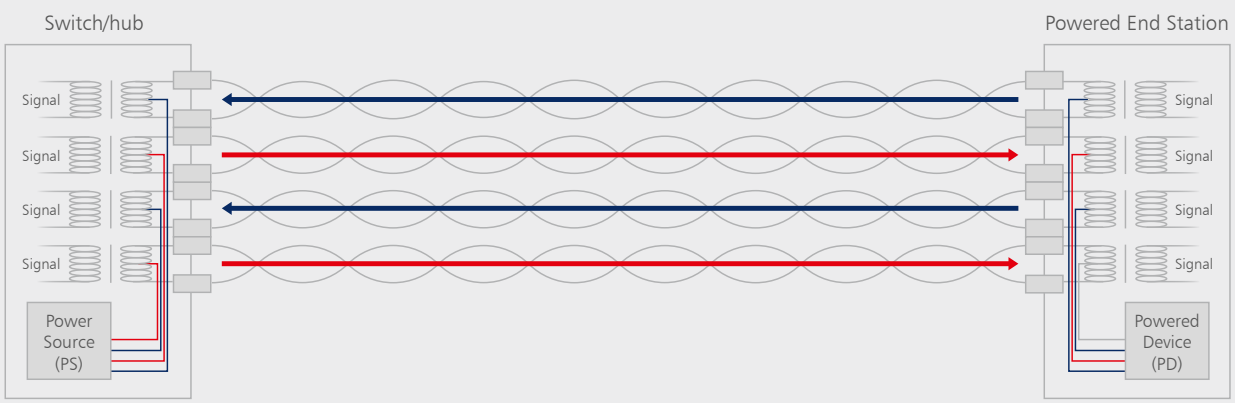
Limit values for shielding parameters according to IEC 61156-5

The table shows a comparison of requirements for cables for the structured cabling, whereby the assignment of the cable types to the performance classes corresponds to the typical measurement results. This shows that although a UTP cable suppresses interference voltages by a factor of 100 (= 40 dB), an S/FTP cable brings it to a factor of 30 000 (= 85 dB).

Remote Powering, Power over Ethernet 4PPoE

Remote powering via data networks will allow the power supply of up to 100 watts. This is almost five times as much as the previous. The corresponding standard IEEE 802.3bt is currently being worked on. With 4PPoE, more powerful devices can be powered via network cables. This enables the omitting of a parallel power cabling. However, the twisted-pair copper cables heat up and their insertion loss increases. It is important to take this into account from the very beginning of a cabling project. This creates new demands for the installation of data networks. Therefore, the cable heating and through a remote powering to be accounted for during a cabling project. Thick cable bundles and heat accumulation in cable ducts should be avoided. Higher temperatures increase the line resistance and attenuates the signal transmission, which reduces the possible line distance of a link. The heating of the cable by the current transmission can increase the attenuation of a cable to such an extent that a data transmission is severely restricted or even impossible. We recommend using larger conductor cross-sections and shielded cables for longer cabling distances. These heat up less excessively.

Power over Ethernet 4PPoE

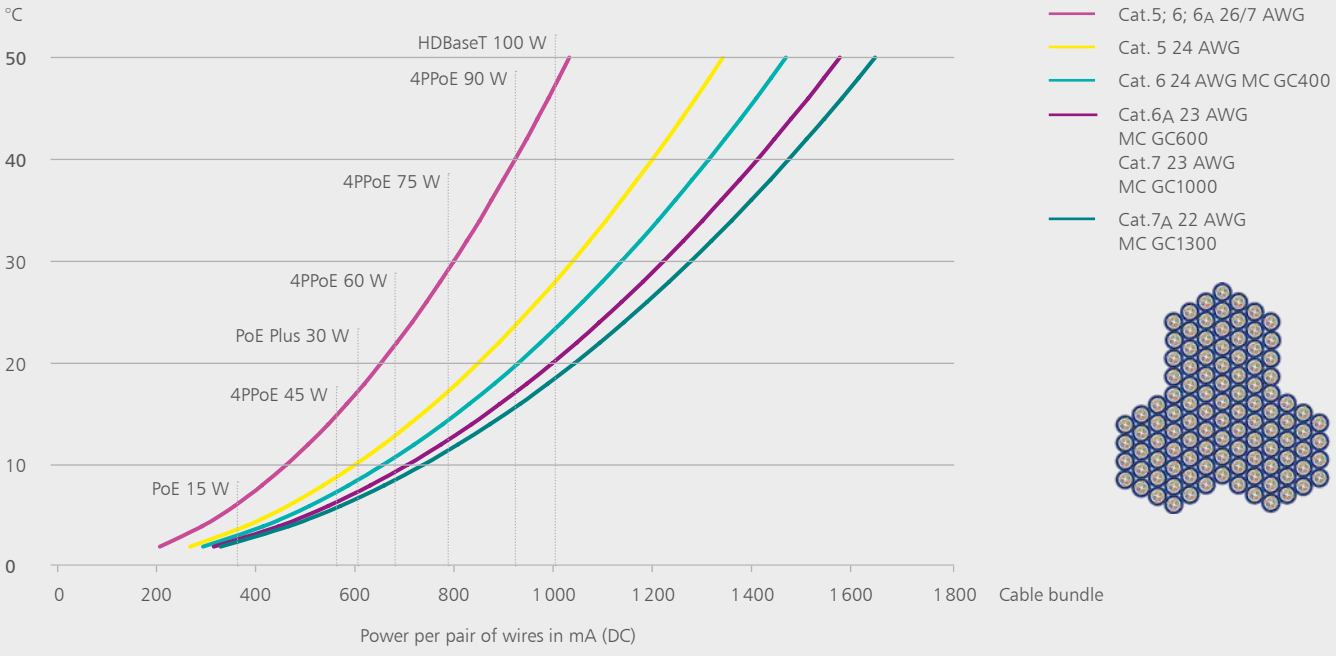


Temperature rise for cables by category in relation to the number of loaded wire pairs (1000 mA/pair) (4PPOE with 100 W)

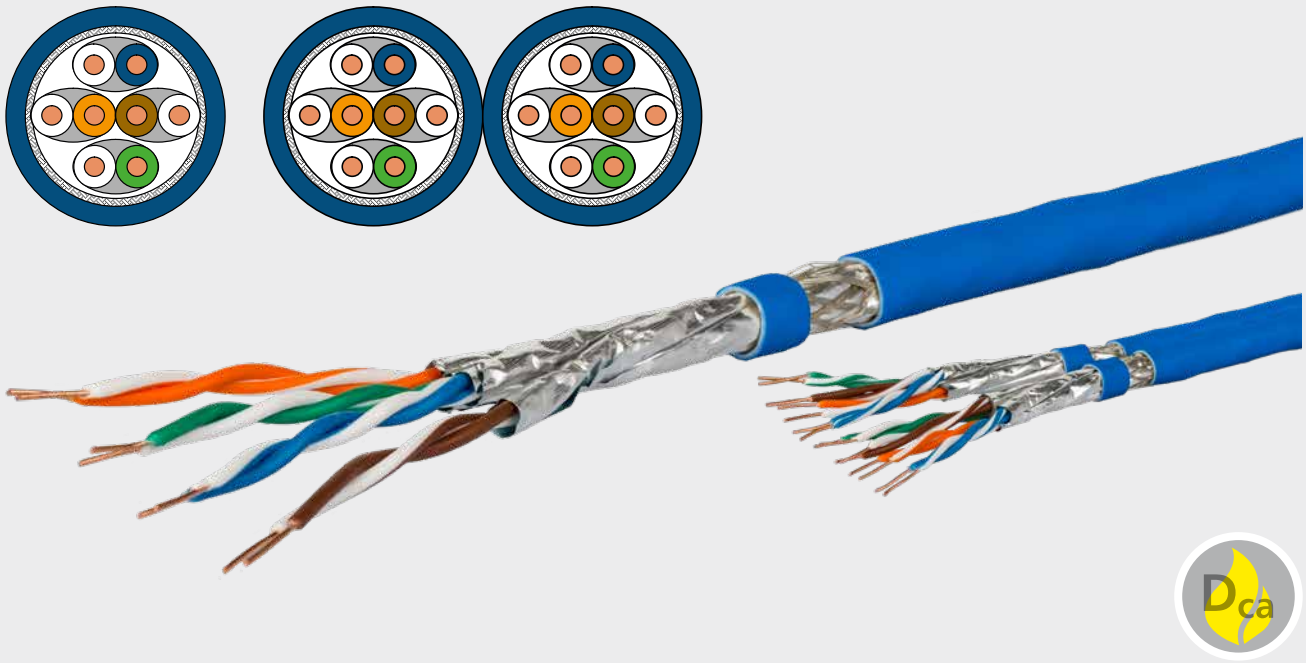
CABLE CATEGORY	Cat.5; 6; 6A	Cat.5	Cat.6	Cat.6A	Cat.7	Cat.7A
Wire diameter	26/7 AWG	24 AWG	24 AWG	23 AWG	23 AWG	22 AWG
METZ CONNECT cable type	Patch cord 130845xxyy DCCS 26/1		MC GC400	MC550 MC GC600	MC GC1000 DCCS 23/1	MC GC1300
Number of pairs with 1000 mA load						Temperature increase °C
24	2,8	1,7	1,4	1,2	1,2	1,1
48	5,6	3,3	2,8	2,4	2,4	2,2
96	11,3	6,7	5,5	4,8	4,8	4,4
144	16,9	10	8,3	7,2	7,2	6,7
192	22,6	13,3	11,1	9,6	9,6	8,9
200	23,5	13,9	11,6	10	10	9,3
236	27,7	16,4	13,6	11,8	11,8	10,9
284	33,4	19,7	16,4	16,4	14,2	13,1
332	39	23,1	19,2	16,6	16,6	15,4
380	44,7	26,4	21,9	19	19	17,6
400	47	27,8	23,1	20	20	18,5

The temperature rise (°C) is based on a current load of 1000 mA in each pair of loaded wires, and the data on the assumed DC resistances of the individual cable types.

Worst case temperature increase in a 100th cable bundle



Copper data cable



MC GC1300 pro22 Cat.7_A S/FTP 4P and 2 x 4P LSHF-FR

Cable design

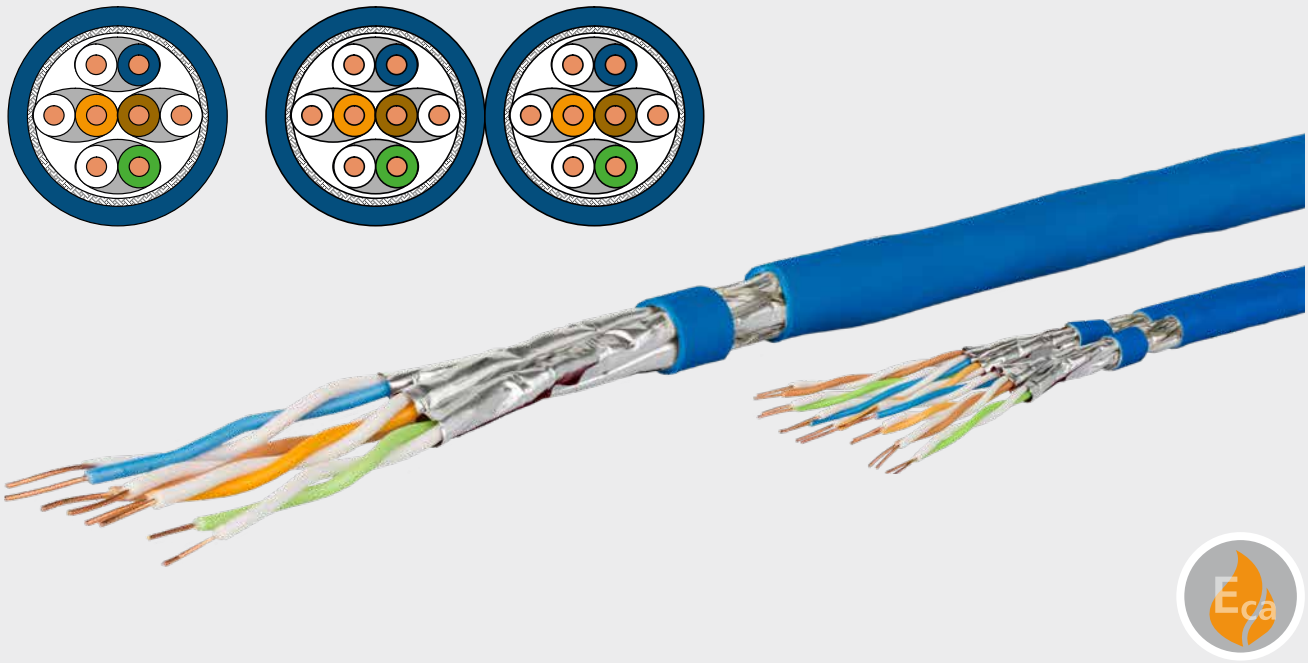
Copper wire insulated with foam-skin polyethylene, stranding 4 pairs (PiMF) to core, 2 cores to pair, pair shielding plastic composite foil, aluminium coated, copper braiding tin-plated, protective sheath LSHF-FR (FRNC-FR) = Low Smoke Halogen Free Flame Retardant, Flame Retardant according to IEC 60332-1; IEC 60754-2; IEC 61034 and IEC 60332-3-24.

Areas of application

Data copper installation cable for use in primary, secondary and tertiary areas in the structured building cabling according to EN 50173-1, EN 50288-9-1, ISO/IEC 11801 Ed.2, IEC 61156-5.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7,5	15,1
Fire load (MJ/km)		660	1 350
Weight (kg/km)		66	123
Tensile force (N)		140	280
Bending radius (mm)	In operation	≥ 30	≥ 60,4
	for installation	≥ 60	≥ 120,8
Cu number		35	70
Operating temperature range (°C)	stock	-20 to +60	
	operation	0 to +50	
Fire class		D_{ca}	

Copper data cable



MC GC1000 plus23 Cat.7 S/FTP 4P and 2 x 4P LSHF

Cable design

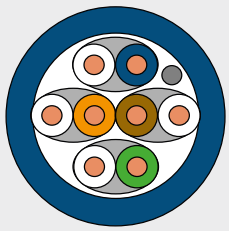
Copper wire insulated with foam-skin polyethylene, stranding 4 pairs (PiMF) to core, 2 cores to pair, pair shielding plastic composite foil, aluminium coated, copper braiding tin-plated, protective sheath LSHF (FRNC), Flame Retardant to IEC 60332-1; IEC 60754-2 and IEC 61034.

Areas of application

Data copper installation cable for use in primary, secondary and tertiary areas in the structured building cabling according to EN 50173-1, EN 50288-4-1, ISO/IEC 11801 Ed.2 and IEC 61156-5.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7,0	15,0
Fire load (MJ/km)		590	1 190
Weight (kg/km)		54,5	109,2
Tensile force (N)		110	220
Bending radius (mm)	In operation		≥ 40
	for installation		≥ 80
Cu number		26	52
Operating temperature range (°C)	stock		-20 to +60
	operation		0 to +50
Fire class			E_{ca}

Copper data cable



MC GC600 F1 23 Cat.6_A U/FTP 4P LSHF

Cable design

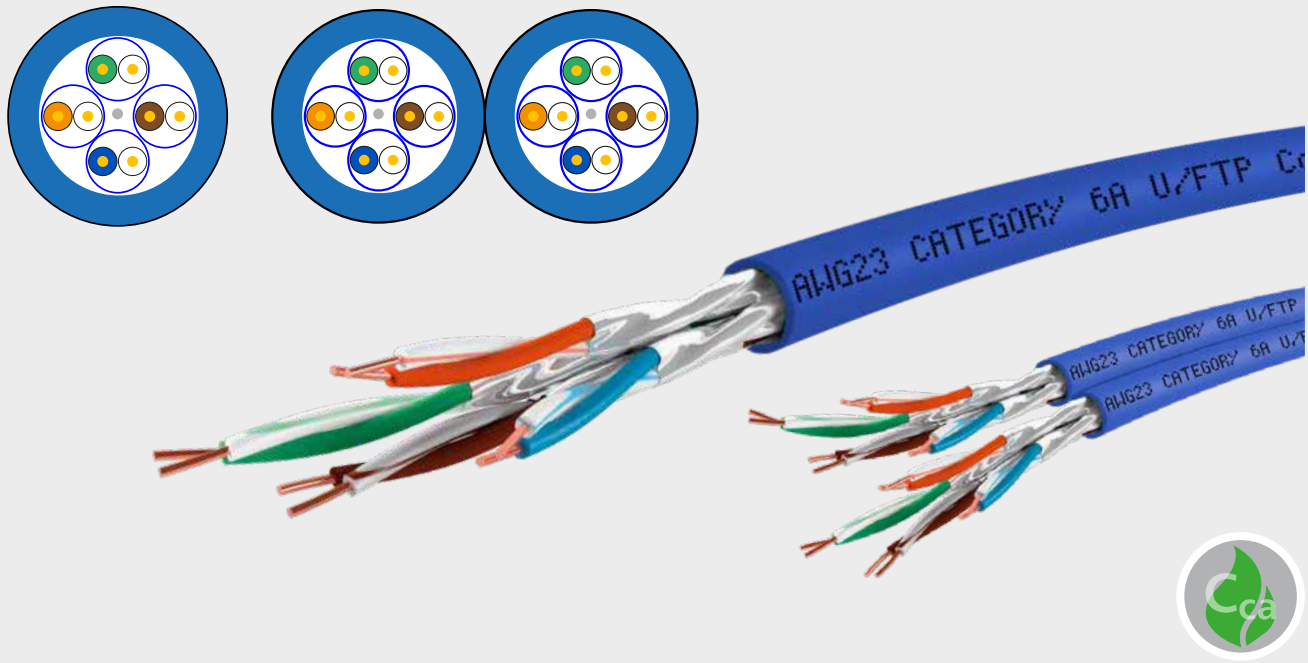
Copper wire insulated with polyethylene, stranding 4 pairs to core with non-metallic separation element in the core, 2 wires per pair, primary sheath LSHF, interrupted film as separation layer to the protective sheath, protective sheath LSHF (FRNC), flame-resistant pursuant to IEC 60332-1; IEC 60754-2 and IEC 61034.

Areas of application

Data copper installation cable for use in primary, secondary and tertiary areas in the structured building cabling according to EN 50173-1, EN 50288-11-1, ISO/IEC 11801 Ed.2, IEC 61156-5 and EIA/TIA 568-C.2.

CHARACTERISTICS		
Outer diameter (mm)		7.0
Fire load (MJ/km)		732
Weight (kg/km)		46
Tensile force (N)		100
Bending radius (mm)	In operation	≥ 28
	for installation	≥ 56
Cu number		21
Operating temperature range (°C)	stock	-20 to +60
	operation	0 to +50
Fire class		Eca

Copper data cable



MC 550 AWG 23 Cat.6_A **U/FTP** 4P LSHF-FR

Cable design

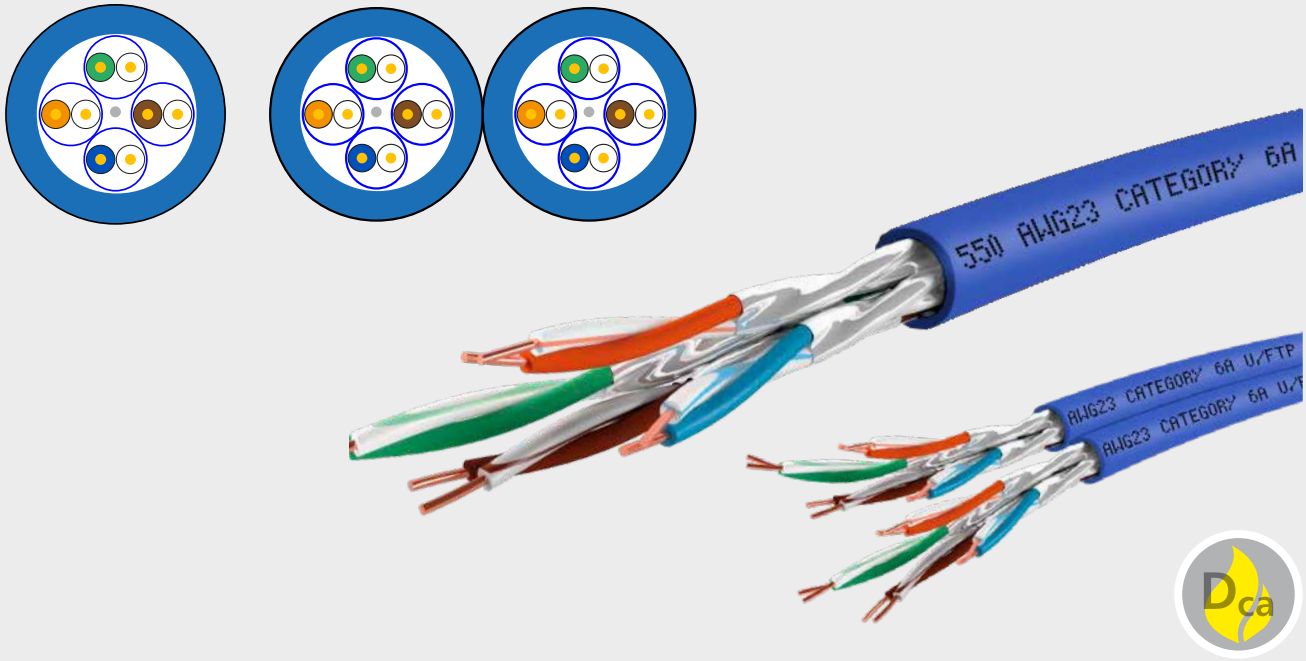
Copper wire insulated with polyethylene, stranding 4 pairs to the core, 2 cores to the pair, pair shield pet/aluminum foil and tinned twin wire AWG26, cable sheath LSHF (LSOH), flame retardant EN 60332-1, IEC 60332-1, EN 60332-3-24, IEC 60332-3-24,EN 61034-2, IEC 61034-2, IEC 60754-1 and EN 50267-1.

Areas of application

Data and communication cables for use in secondary and tertiary applications in structured building cabling according to EN 50173-1 and ISO 11801-1.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7,8	7.2 x 15.20
Fire load (MJ/km)		721	962
Weight (kg/km)		60	91
Tensile force (N)		98	196
Bending radius (mm)	In operation	≥ 30	≥ 30
	for installation	≥ 60	≥ 60
Cu number		19,20	38,4
Operating temperature range (°C)	stock	0 to 50	0 to 50
	operation	-20 to -60	-20 to +60
Fire class			C_{ca}

Copper data cable



MC 550 AWG 23 Cat.6$_A$ **U/FTP** 4P LSHF-FR

Cable design

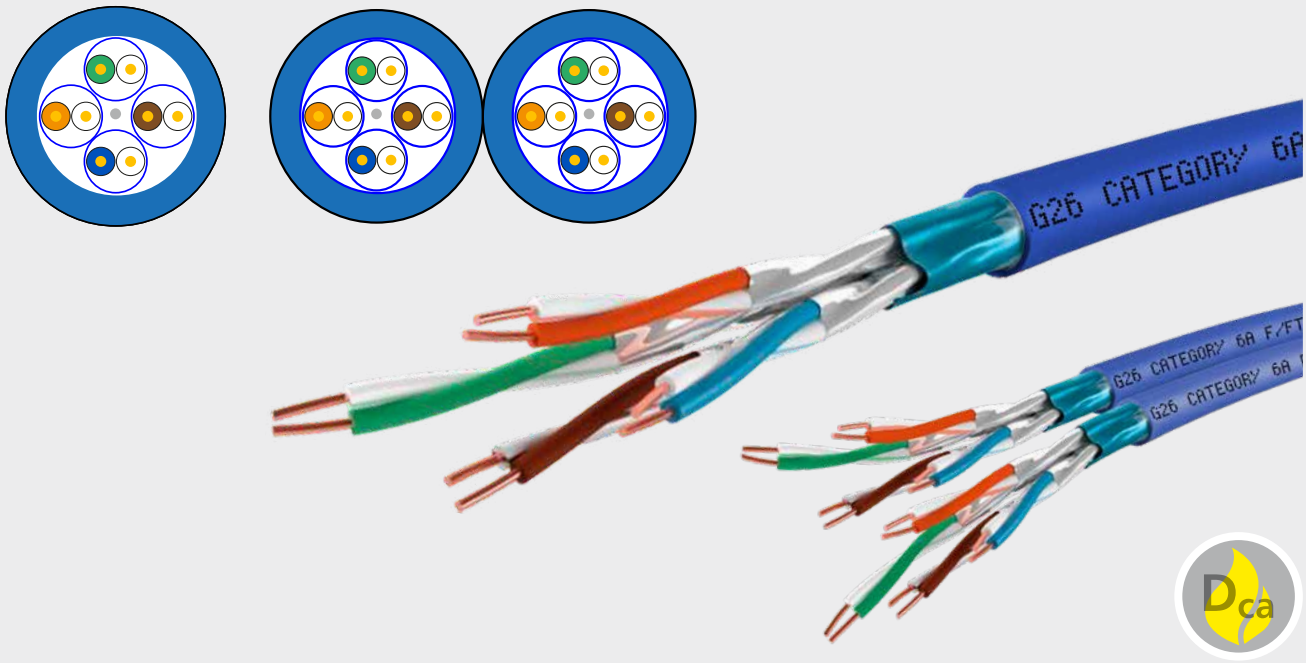
Copper wire insulated with polyethylene, stranding 4 pairs to the core, 2 cores to the pair, pair shield pet/aluminum foil and tinned twin wire AWG26, cable sheath LSHF (LSOH), flame retardant EN 60332-1, IEC 60332-1, EN 60332-3-24, IEC 60332-3-24,EN 61034-2, IEC 61034-2, IEC 60754-1 and EN 50267-1.

Areas of application

Data and communication cables for use in secondary and tertiary applications in structured building cabling according to EN 50173-1 and ISO 11801-1.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7.1	7.30 x 15.30
Fire load (MJ/km)		469	962
Weight (kg/km)		45	91
Tensile force (N)		98	196
Bending radius (mm)	In operation	≥ 30	≥ 30
	for installation	≥ 60	≥ 60
Cu number		19.20	38.4
Operating temperature range (°C)	stock	0 to 50	0 to 50
	operation	-20 to +60	-20 to +60
Fire class			D_{ca}

Copper data cable



MC 550 AWG 23 Cat.6_A **F/FTP** 4P LSHF-FR

Cable design

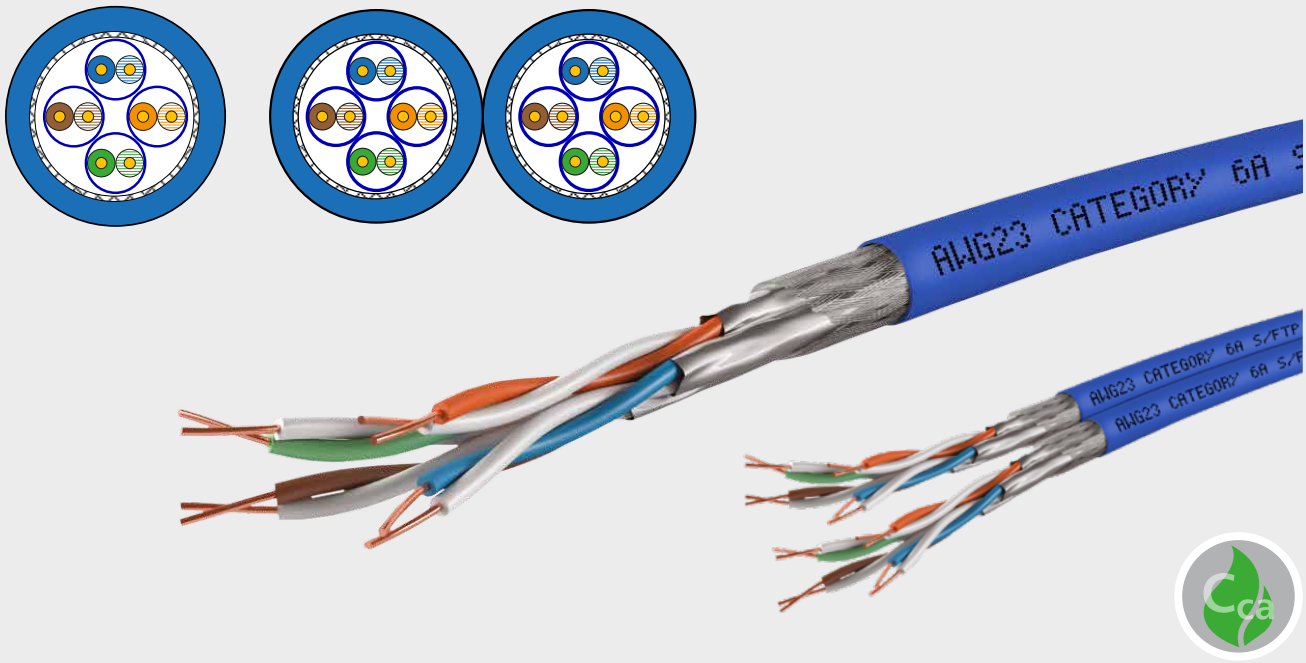
Copper wire insulated with polyethylene, stranding 4 pairs to the core, 2 cores to the pair, pair shielding Pet/Alu-foil and tinned two-wire AWG26, cable sheath LSHF (LSOH), flame retardant according to EN 60332-1, IEC60332-1, EN60332-3-24, IEC 30332-3-24, EN 61034-2, IEC 61034-2, IEC 60754-1 and EN 50267-1.

Areas of application

Data and communication cables for use in secondary and tertiary applications in structured building cabling according to EN 50173-1 and ISO 11801-1.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7.3	7.3 x 15.3
Fire load (MJ/km)		550	1125
Weight (kg/km)		53	102
Tensile force (N)		98	196
Bending radius (mm)	In operation	≥ 30	≥ 30
	for installation	≥ 60	≥ 60
Cu number		30	60
Operating temperature range (°C)	stock	0 to 50	0 to 50
	operation	-20 to +60	-20 to +60
Fire class			D_{ca}

Copper data cable



MC 550 AWG 23 Cat.6$_A$ **S/FTP** 4P LSHF-FR

Cable design

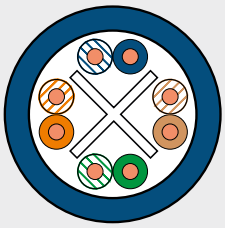
Copper wire insulated with with polyethylene, stranding 4 pairs to the core, 2 cores to pair, pair shielding aluminum/polyester, cablesheath LSHF (LSOH), overall shielding copper braid, cable-sheath LSHF (LSOH), flame retardant according to EN 60332-1, IEC 60332-1, EN 61034-2 and IEC 61034-2.

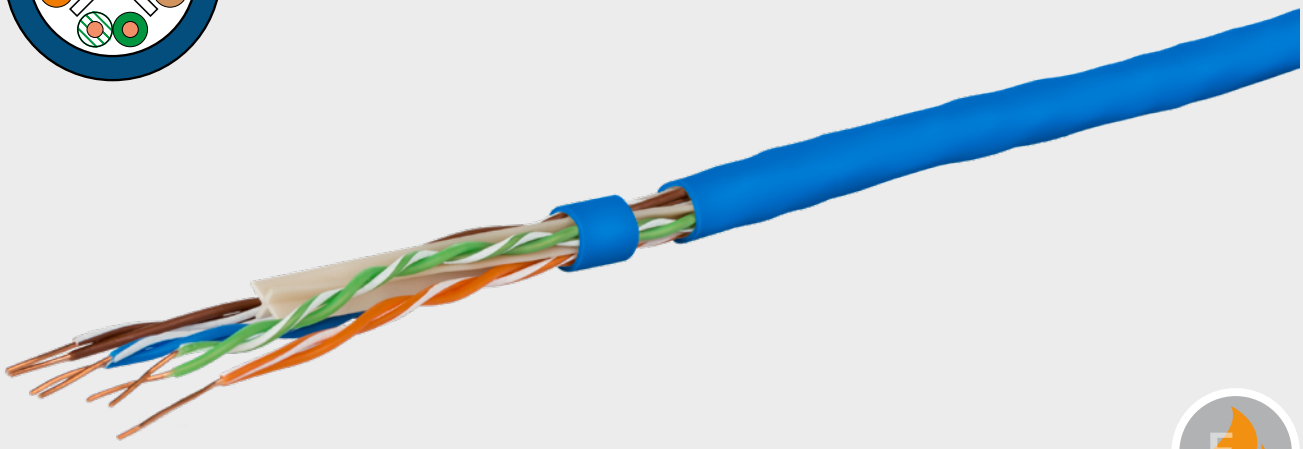
Areas of application

Data and communication cables for use in secondary and tertiary and tertiary areas in structured building cabling according to EN 50173-1 and ISO 11801-1.

CHARACTERISTICS		SIMPLEX	DUPLEX
Outer diameter (mm)		7.4	7.4 x 15.40
Fire load (MJ/km)		449	988
Weight (kg/km)		51	112
Tensile force (N)		95	190
Bending radius (mm)	In operation	≥ 30	≥ 30
	for installation	≥ 60	≥ 60
Cu number		22	44
Operating temperature range (°C)	stock	0 to 50	0 to 50
	operation	-20 to +60	-20 to +60
Fire class			C_{ca}

Copper data cable





MC GC400 SL23 Cat.6 U/UTP LSHF

Cable design

Copper wire insulated with polyethylene, stranding 4 pairs to core with non-metallic separation element in the core, 2 wires per pair, protective sheath LSHF (FRNC), Flame Retardant to IEC 60332-1; IEC 60754-2 and IEC 61034.

Areas of application

Data copper installation cable for use in primary, secondary and tertiary areas in the structured building cabling according to EN 50173-1, EN 50288-6-1, ISO/IEC 11801 Ed.2, IEC 61156-5 and EIA/TIA 568-C.2

CHARACTERISTICS		
Outer diameter (mm)		5.3
Fire load (MJ/km)		316
Weight (kg/km)		36
Tensile force (N)		100
Bending radius (mm)	In operation	≥ 21.2
	for installation	≥ 42.4
Cu number		18.1
Operating temperature range (°C)	stock	-20 to +60
	operation	0 to 50
Fire class		Eca

Product overview copper

TYPE	BANDWITH	CLASS	AWG	CABLE STRUCTURE	FIRE CLASS	PAIRS	PACKING (DRUM)	P/N
MC GC1300 pro22 LSHF-FR Cat.7$_A$	25/10 GBit	F_A	22/1	S/FTP	D_{ca}	4P	100 m	1308427B34145
							500 m	1308427B34141
							1000 m	1308427B34142
						2x4P	500 m	1308427B34143
MC GC1000 plus23 LSHF Cat.7	10 GBit	F	23/1	S/FTP	E_{ca}	4P	500 m	1308427032141
							1000 m	1308427032142
						2x4P	500 m	1308427032143
MC GC600 F1 23 LSHF Cat.6$_A$	10 GBit	E_A	23/1	U/FTP	E_{ca}	4P	500 m	1308436A32141
MC 550 LSHF-FR Cat.6$_A$	10 GBit	E_A	23/1	U/FTP	C_{ca}	4P	1000 m	130842A6AUFCT
						2x4P	500 m	130842A6AUFCFD
				U/FTP	D_{ca}	4P	1000 m	130842A6AUFDT
						2x4P	500 m	130842A6AUFDFD
				F/FTP	D_{ca}	4P	1000 m	130842A6AFFDT
						2x4P	500 m	130842A6AFFDFD
				S/FTP	C_{ca}	4 P	1000 m	130842A6ASFCT1
						2x4P	500 m	130842A6ASFCF1D
MC GC400 SL LSHF Cat.6	1 GBit	E	23/1	U/UTP	E_{ca}	4P	305 m*	1308406032140
							500 m	1308406032141

*in box

Detailed knowledge within seconds

Our website www.metz-connect.com will provide you with comprehensive information on all technical details.

Here, you will find data sheets and also all connectors for our cables and lines at: www.metz-connect.com/configurator

Notes

Online cable configurator –

quick and easy

Whether you're planning a new network cable system or expanding an existing installation – the fastest and simplest route to an individual data network is to use pre-assembled installation cables.

That's exactly what the METZ CONNECT cable configurators offer in a convenient online tool.

Attractive design, simple, intuitive operation and the ability to run directly in your browser without installing any additional software. Just a few options to select and you're ready to set up a wide range of cable assemblies for configuring and requesting structured cabling.

You get all the key information for every configuration: article number, brief description and sale price. The list price can be discounted directly using your discount level.

Various cable types can be configured: from pre-assembled fiber optic installation cable to fiber optic patch cable to IP-protected copper and fiber optic lines. A wide range of configurations is possible. Added features include a selection of suitable patch fields and the option to see detailed product information sheets.

Wide range of production depth in Fiber optics and copper manufacture

METZ CONNECT's cable configurator is always at the cutting edge. It is regularly expanded with new functions and product options.

Please give us a call if your specific cabling needs cannot be realised in the cable configurator. Our wide range of fiber optics products which we manufacture in-house helps us to specify your special cable specifications.

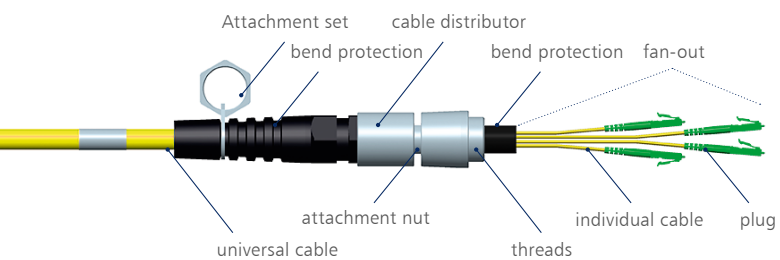
More information is available in our product information sheets for the cable configurator. These provide all the product specification details. This includes information about the actual design of pre-assembled installation cable (VIK), the different variants for cable distributors and associated order numbers.

Dimensions and packaging types are provided in addition to mechanical data and performance values for individual components. Detailed information is given on fan-out protection variants and attachment options for the cables.

Of course, METZ CONNECT optical parameters, such as insertion and return loss, are also specified in the product information.

Excerpt from the product information: „VIK with universal cable".

Design (labelling)



Specifications

up to 12 fibers

up to 24 fibers

up to 48 fibers

METZ CONNECT

We realize ideas

METZ CONNECT GmbH
Im Tal 2
78176 Blumberg
Germany

Phone +49 7702 533-0
Fax +49 7702 533-189

info@metz-connect.com
www.metz-connect.com

METZ CONNECT USA Inc.
200 Tornillo Way
Tinton Falls, NJ 07712
USA
Phone +1 732 389 1300
Fax +1 732 389 9066

METZ CONNECT France SAS
28, Rue Schweighaeuser
67000 Strasbourg
France
Phone +33 3886 17073
Fax +33 3886 19473

METZ CONNECT AUSTRIA GmbH
c/o German chamber of commerce in Austria
Schwarzenbergplatz 5, Top 3/1
1030 Vienna
Austria
Phone +43 1 227 12 64
Fax +43 1 227 12 66

METZ CONNECT Zhongshan Ltd.
Ping Chang Road
Ping Pu Industrial Park
Sanxiang Town
Zhongshan City, 528463
Guangdong Province
China
Phone +86 760 86365055
Fax +86 760 86365050

METZ CONNECT Asia Pacific Ltd.
Suite 1803, 18/F
Chinachem Hollywood Centre,
1 Hollywood Road, Central
Hong Kong
Phone +852 26 027 300
Fax +852 27 257522

RIA CONNECT BTR NETCOM

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