Draka

UC DATA CABLE

Fast, reliable and ubiquitous part of the Draka Office Network Solution

Linking communications to communities

A brand of the

Prysmian Group

PRYSMIAN GROUP – A LEADING PLAYER IN THE CABLE INDUSTRY

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through two renowned commercial brands – Prysmian and Draka – based in around 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.

CABLE CONCEPTS WITH FUTURE PROSPECTS

For many decades, we have been designing, developing, manufacturing and selling a variety of high-quality copper and optical fi bre cables in order to off er you cable solutions for present and future challenges – let it be standard products or tailormade special cables. In the communication infrastructure, our well proven products are always in use wherever it is a question of professional and undisturbed data, voice, audio and video transmission. The Draka UC range as described in this brochure has been designed for data transmission and off ers a high-capacity and fl exible cable concept with best future prospects to our customers from within the industry, trade and service sector.

High speed

The demands on modern networks are very high. Speed and transmission reliability are of utmost priority. In this respect, Gigabit Ethernet off ers an enormous potential for the future. For many years, we have been a partner to companies from within the industry, trade and service sector. Thus we are well aware of our customers' needs. Planning reliability is an important factor for you and for us, as today's cable concepts must also meet the requirements of tomorrow's developments. The Draka UC range has the physical potential to support structured networking for future requirements.

Our product range (Cat.5e, Cat.6_A, Cat.7, Cat.7_A and Cat8.2 cables) has been adjusted to a variety of applications and allows highest transmission ratios. For high-end applications, our UC series off er important reserve capacity. Our cable series have been designed to also allow cable sharing between all categories on the level of the lower category.

Flexibility

Our high-quality UC cables are always in use wherever it is a question of high-speed data transmission in local networks (LAN). They are used for standardized and manufacturer-independent networks – e.g. Token Ring, Ethernet, ISDN, TPDDI, Fast Ethernet 1000BaseT, 10GbE or 40GbE. Aside from voice and data communication, our solutions are also applicable for video communication. Among others, our product range comprises installation and patch cables which have been tested as to their compatibility with common components. Thus, we can guarantee maximum transmission reliability.

Free choice

The right equipment for all applications: Whether high transmission capacity, electromagnetic compatibility (EMC) or best fire retardancy characteristics: We can off er the optimum data cable for every application. All our products are certainly manufactured at the highest quality standards. And it is no question that we will be pleased to advise you as to the installation. Short delivery times and best service guaranteed.

	Types	Frequency Mhz	EN 50173	ISO/ IEC 11801 2 ed
	UC300	100 MHz	Cat 5e Classe D	Cat 5e Classe D
	UC400	250 MHz	Cat 6 Classe E	Cat 6 Classe E
	UC500	500 MHz	Cat 6_A Classe E_A	Cat 6_A Classe E_A
	UC900	600 MHz	Cat 7 Classe F	Cat 7 Classe F
	UC1200	1200 MHz	Cat 7_A Classe F_A	Cat 7_A Classe F_A
	UC1500	1200 MHz	Cat 7_A Classe F_A	Cat 7_A Classe F_A
	UC^{FUTURE} Cat8.2	1600/2000 MHz	Cat8.2 Class I+II	Cat8.2 Class I+II

CABLING FOR FUTURE REQUIREMENTS

The data transmission according to Gigabit-Ethernet 1000BaseT is based on a “full-duplex principle“ – i.e. via all cable pairs at the same time and parallel in both directions (bi-directional). This results in numerous closely tolerated transmission characteristics for cabling in future requirements. The most important characteristics for the future are: PSNEXT, PS-ELFEXT and PS-ACR.

Convincing PowerSum

The major reason for interference in local networks is the NEXT (Near End Crosstalk). This eff ect is caused by mutual influence (coupling) of pairs next to each other. The higher the transmission performance the stronger the interference. In modern network applications being based on a bi-directional data transmission, the interference increases. Power Sum (PS) values can be calculated for all relevant characteristics. In times of high data rates they allow indications of the performance and transmission capabilities of a data cable. For example, a high PS-NEXT is important for users. Due to the core stranding and the patented foil screening, the high-end cables of our UC1500 series reach values being nearly 30 dB better than required by the Cat 7 standard.These resources are also for your benefit.

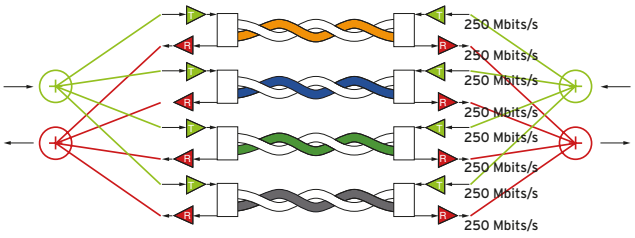
Standards

The received signal is decisive for all highspeed networks. Here, the FEXT (Far End Crosstalk) measures the crosstalk at the receiver. Due to the cable attenuation, the FEXT is substantially lower than the NEXT. The more meaningful characteristics ELFEXT (Equal Level Far End Crosstalk) for the transmission performance can be obtained by deducting the insertion loss from the FEXT value. The resultant PowerSum then is PS-ELFEXT.

UNDISTURBED SIGNALS

The chart shows the inference caused by NEXT and FEXT under realistic conditions and with full utilisation of Gigabit Ethernet. A transfer of information is only possible when the encoded data can be recognised, i.e. the attenuated signal at the receiver must be considerably stronger than the constant interference signal NEXT.

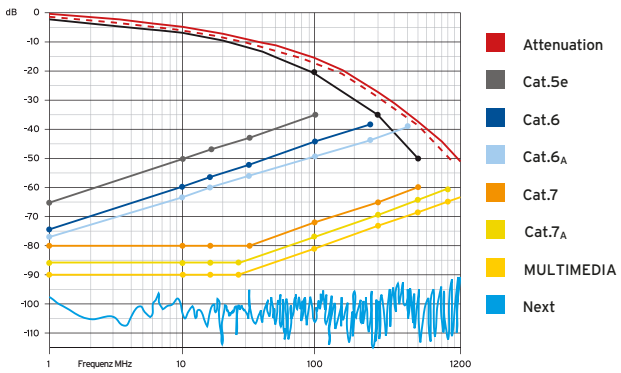
Only the application of data cables with optimum channel separation protects against unintended inference and thus represents the condition for the full utilisation of the advantages of modern network application.



T = Transmitter
R = Receiver

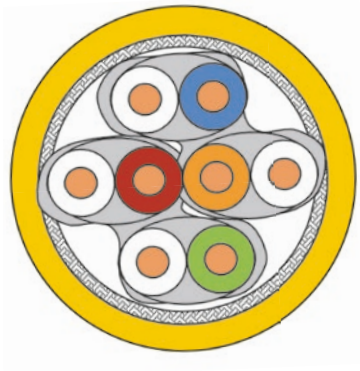
RELEVANT CHARACTERISTICS

The central characteristics of a passive network is the ACR (Attenuation Crosstalk Ratio). The ACR shows the attenuation ratio in proportion to the crosstalk ratio. The quality of the transmission is determined by the signal-to-noise ratio (sum of all interferences). Thus, the PS-ACR (cable signal-to-noise ratio) is the relevant characteristics for the assessment of the transmission capacity.



MINIMUM ACR

A minimum ACR of 10 dB is required for highest signal frequencies.
The higher the frequency the lower the ACR. Example: For our data cable UC MULTIMEDIA 1500, the measurement result shows that the near-end-crosstalk attenuation is on such a low level that it can hardly be traced.



10GBASE-T PERFORMANCE

10Giga bit Ethernet is simply the next protocol above 1000BaseT and is 10 times faster, 10 times more bandwidth, higher performance. Using the same full duplex systems copper cabling delivers bidirectional transmission rates at 250MHz per pair.

Transmission Parameters already laid out by 1000BaseT are enough for the increase with only one extra test required, Exogeneous (alien) Xtalk (electrical noise).).

Error detection

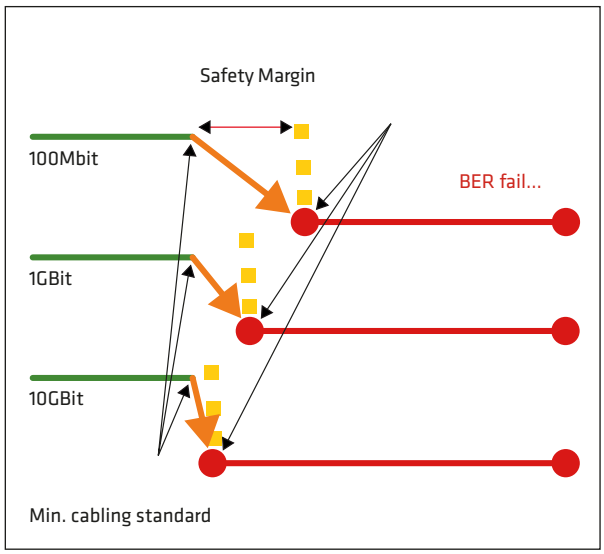
Ethernet works because of Error Detection Systems. The receiving end will poll until transmission is correct. If a system is noisy the error detection will retransmit the same information many times, slowing every transmission: there is a point at which the system will fail. 10G has the smallest safety (fail) margin. The components have to be good.

Margin

In standardisation the margin is built in to ensure plug and play works fi rst time. 100m of cabling is guaranteed to work using components that are manufactured to the standard. The margin is steadily becoming smaller, 10G is almost non-existent, as the error detection systems cannot work above a certain noise level. As bandwidth in increases so does noise, no matter how good components are. The min. cabling standard is the lowest minimum possible, the TIA being the lowest, and can always be improved which is Draka's intention.

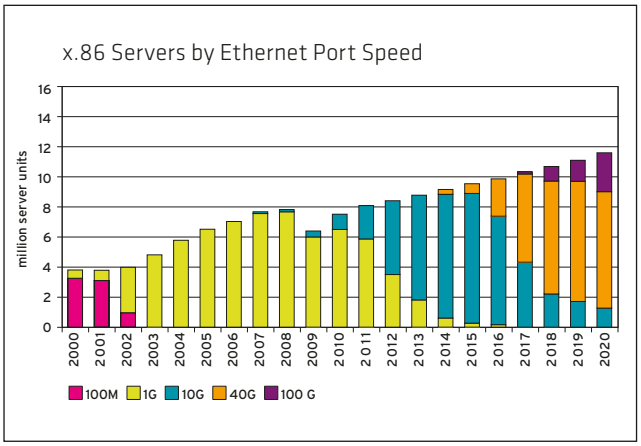
Exogenous (Alien) Xtalk

Alien Xtalk is the disturbance (noise) coupled onto a transmitting signal pair from all the other transmitting pairs (all other systems plus 10G). Space between the pairs does decrease the level of noise, and can be seen in the graph, that a U/UTP with help (distance increased) nearly passes the test.



40GBASE-T PERFORMANCE

The trend towards even higher bandwidth demand in the network technology is advancing apace. Data centers area considered as the place with the highest technical data requirements. Here condense information flows and processed in server farms, stored in storage networks by routers and switches in other areas of the network - locally and globally - directed. Data rates of 10 Gbit/s will not be sufficient in a few years, to meet the exploding demand for bandwidth in data centers. Thereupon IEEE 802.3 has approved by a large majority to establish a 40-GBASE-T Study Group.



Class I+II

Within the draft standard ISO / IEC TR 11801-99-1, are the new standards with the classes I and II in development. Currently is 1600 and 2000 MHz in the discussion for the bandwidth / frequency range. The transmission link & Link Class I / Cat8.1: based on Cat.6_A and corresponds approximately with Cat.8 according to TIA-568-C.2.1 with extended frequency range up to 2000 MHz. Cat8.1 is backward compatible only up to Cat.6_A.

The transmission link & Link Class II /Cat8.2 is based on Cat.7_A with extended frequency range. Cat8.2 is backward compatible with Cat.7_A and all categories below.

This is offset by the standard draft according to TIA-568-C.2. The transmission link is based on Cat.6A with extended frequency range up to 2000 MHz. A backward compatibility is given only up to Cat.6_A. Within the TIA standards, there is no specification for category 7 and 7_A existing.

Cat8.2

	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.7	Cat.7_A	Cat.8.2
Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3
Cat.5	Cat.3	Cat.5	Cat.5	Cat.5	Cat.5	Cat.5	Cat.5
Cat.6	Cat.3	Cat.5	Cat.6	Cat.6	Cat.6	Cat.6	Cat.6
Cat.6_A	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.6_A	Cat.6_A	Cat.6_A
Cat.7	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.7	Cat.7	Cat.7
Cat.7_A	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.7	Cat.7_A	Cat.7_A
Cat8.2	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.7	Cat.7_A	Cat8.2

Cat8.1

	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.7	Cat.7_A	Cat.8.1
Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3	Cat.3
Cat.5	Cat.3	Cat.5	Cat.5	Cat.5	Cat.5	Cat.5	Cat.5
Cat.6	Cat.3	Cat.5	Cat.6	Cat.6	Cat.6	Cat.6	Cat.6
Cat.6_A	Cat.3	Cat.5	Cat.6	Cat.6_A	Cat.6_A	Cat.6_A	Cat.6_A
Cat.7	Cat.3	Cat.5	Cat.6	Cat.6_A	~~Cat.7~~	~~Cat.7~~	~~Cat.7~~
Cat.7_A	Cat.3	Cat.5	Cat.6	Cat.6_A	~~Cat.7~~	~~Cat.7_A~~	~~Cat.7_A~~
Cat8.1	Cat.3	Cat.5	Cat.6	Cat.6_A	~~Cat.7~~	~~Cat.7_A~~	Cat8.1

DATA CENTRE CABLING TOPOLOGY & STRUCTURE

The need for high reliability, along with always required cost efficiency, has established a widely accepted cabling concept in recent years which today is well defined in international standards like EN50173-5 or TIA942. Data centres are split into four levels that help allocate the typical services and applications.

The Client level contains devices like a server – let it be desk top or rack format or even the modern blades – and all kind of storage devices and systems like SAN or NAS, including tape recording devices for backup purposes.

Access switches are situated at the next level, made to couple and connect all devices from client level.

The Distribution level is where routers and layer3 switches operate to make dynamic links between the access level with its aggregated d ata traffic and the customer applications driven from remote places.

The Core level in data centres forms the gate - way with firewall functionality to the group of network service providers connecting the data centre to the outside world.

Data centre structure.
Here we look at the three main applications enterprises, hosts and carriers.

Enterprise data centres

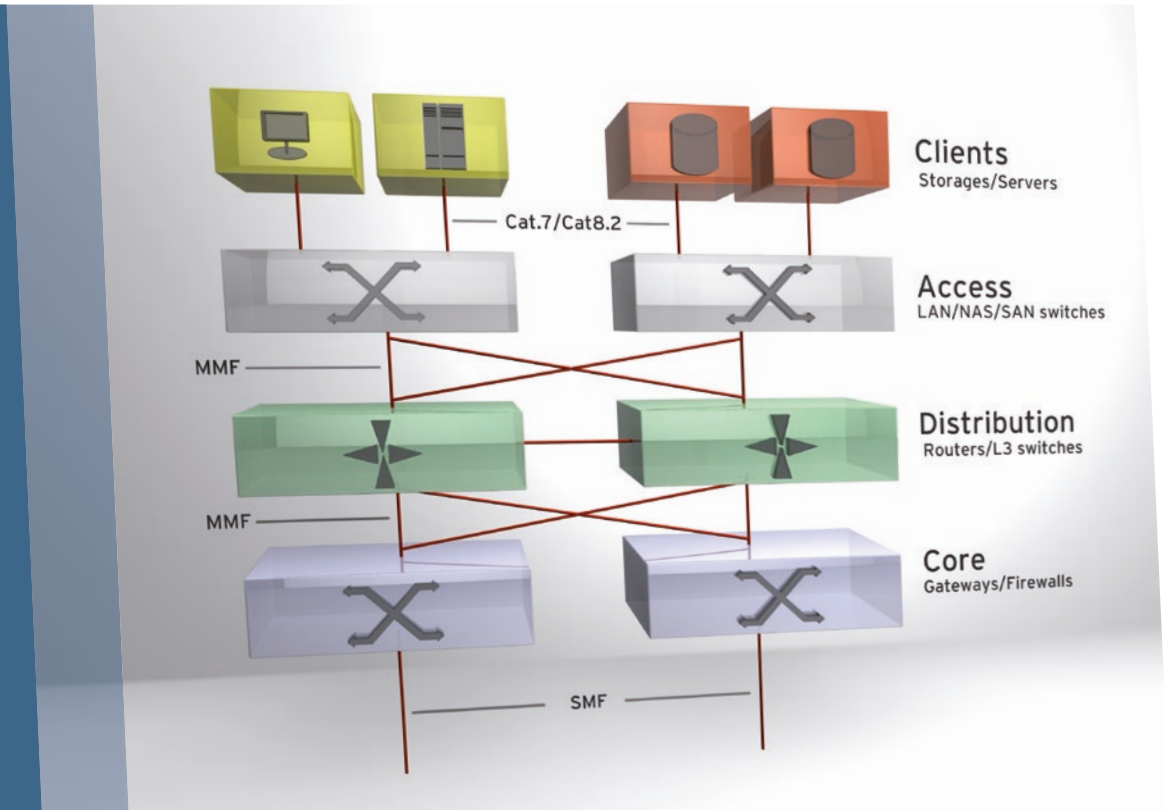
Enterprise data centres are considered the power house of IT. It's where information streams are aggregated and processed in server's farms, where data are put to storage networks and routed through switches into various other parts of the networks - local and / or global.

Carriers

Carriers, for some time already, are faced with growing demands in added-value services based on content which has to be provided in the most efficient way. The data centre cabling standards from TIA and CENELEC can help here as well to deliver valuable planning support and create per - forming networks utilizing easily available interfaces from the Ethernet family.

Data centre hosts

In many cases 500 enterprise clients share their services and in some larger data centre hosts even the number of 5000 clients is exceeded. Managed hosting facilities are attractive to businesses because they can rent IT infrastructure instead of investing in it themselves. Servers, networks, applications, bandwidth and other equipment are managed by employees of the facility.



APPLICATION OF UC^{FUTURE} : DATA CENTRE CABLING

Every data centre is a unique structure. There are various segments of different requirements which need to be understood before creating any solution.

In highly concentrated data centre networks, at server level (Client), the key is to maximize utilization of available pathways, racks and spaces rather than to go for maximum permissible channel length. The required channels of 20m to 60m average distances give room for optimized designs in cable.

For this application Draka has developed the new UC^{FUTURE} program which contains slim cable designs based on existing work area cable standards, which are perfect for zone cabling in data centres because of these characteristics:

- Up to 100% higher packing density in cable trays
- Fully compliant with established cable standards
- PIMF design to eliminate any Alien-Xtalk interferences
- Full 10GBase-T performance over a channel distance of 70m

Especially at Client level bulky cabling forms a serious barrier to air ventilation, literally one of the hot topics in data centres due to growing packing density in server racks and the need to offload the high amount of heat dissipated by all the electronics. Slim designs at server level like the blade technology should be consequently transferred to slim cabling.

The advantages of the new cable design can be leveraged to most suitable slim-design connectivity products which give new opportunities for extended customer specific service concepts. Minimum required transmission performance of cable and cabling is Cat.6_A and/or Class E_A. The rational is to ensure easy migration of services to 10GBase-T, for which cable standards based on various technologies were made.

PERFECTION AND QUALITY

Only a cable ensuring optimum ratios with all characteristics can off er the full performance spectrum. Our multimedia cables go through a constant manufacturing process with extremely close tolerances. With development and production, our emphasis lies on high-quality materials and the state-of-the-art manufacturing processes. Thus we are able to guarantee excellent performance and reliability.

Patented solutions

A compact and solid cable construction guarantees low battenuation and minimum refl ections for the whole frequency range. Due to the high requirements on attenuation, crosstalk and consistency of the impedance, we only use stranded wires or larger copper conductors for the production of our UC cables.

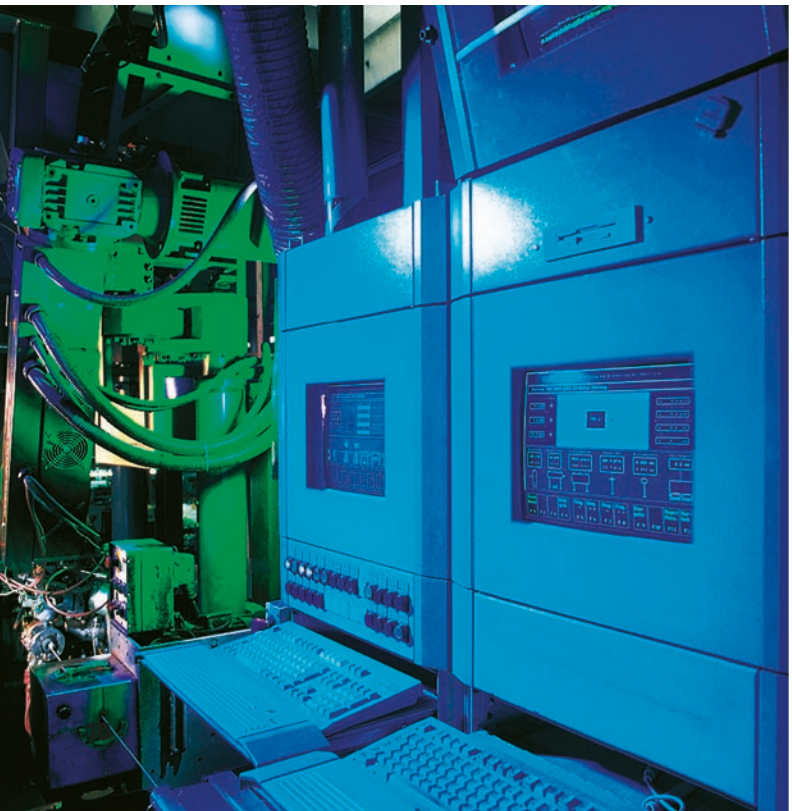
For Cable-Sharing, i.e. several applications on one cable, the pair and overall screening is the best cable construction. With its aluminium-laminated plastic foil and patented foil screening, our cables of series UC400, UC500 and UC1500 guarantee an optimum pair screening.

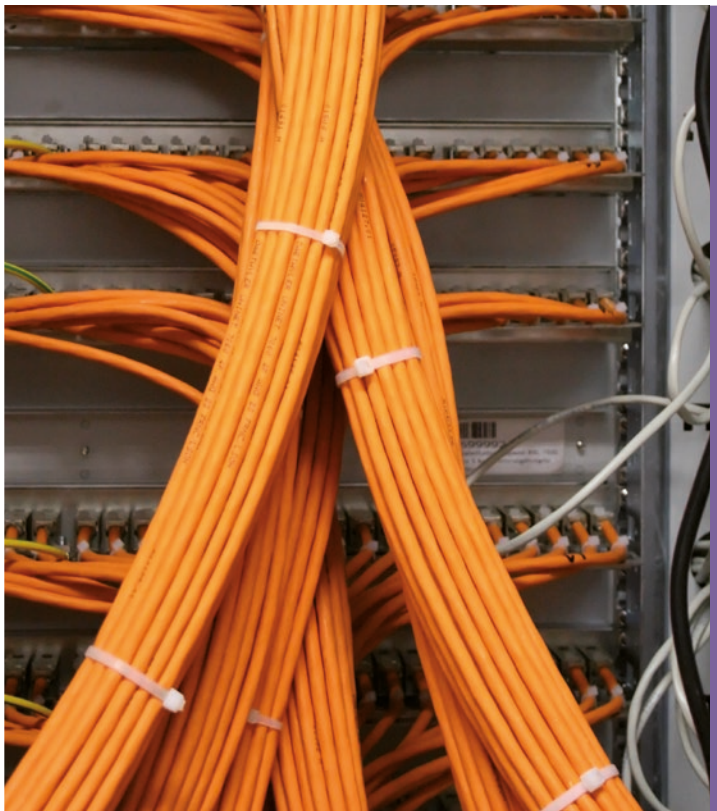
With conductor diameters of 0.56 mm (AWG23) and 0.64 (AWG22), foam-skin core insulations enable us to achieve lowest core diameters. We are of course certifi ed according to ISO 9001, additionally we practise environmental management in line with ISO EN 14001.

Return Loss

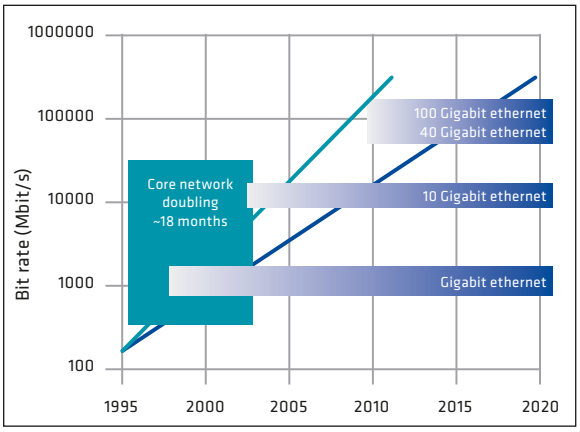
Modern network applications require highquality cables as manufactured here at Prysmian Group. Slight deviations within the insulation material lead to irregularities on the transmission link and cause reflections.

This 'return loss' arises when parts of the transmission signal at the deviation are returned to the transmitter due to reflection.

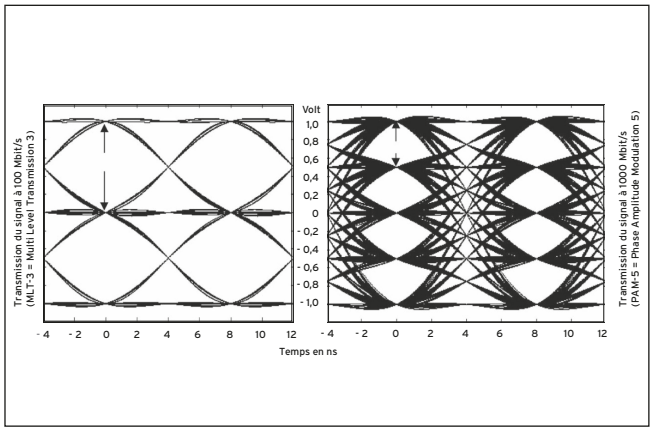




PERFORMANCE



„Standard Growth“ continues to be the trend



Signaltransmission at 100 Mbit/s and 1000 Mbit/s

Propagation Delay and Delay Skew

Due to the increased requirements on Gigabit Ethernet the propagation delay and the delay skew become more important. The delay skew is the transmission time difference of two or more pairs.

With the twisted lengths designed by us, our UC data cables achieve a minimum propagation delay and delay skew of less than 12 ns/100m. A lso with great application lengths, this means full capacity for highspeed applications with synchronous transmission over all 4 pairs.

Transmission reliability

Due to the high data rates, data transmission is increasingly subject to interferences. Low quality cables generate additional interferences and the risk of transmission failure increases.

Despite high-speed applications, existing data rates and the network capacity are not fully used. Therefore, you can rely now on our highquality data cables with hardly any risk of interference. So – invest in the power of your network to meet future requirements.

RELIABILITY AND NOISE IMMUNITY

For many years, „electromagnetic compatibility“ (EMC) has been a ‚must‘ for electric equipment.

The main problem is external interferences impacting the system and causing failures. In the network environment, there are various potential high-frequency interference sources that are between 80.0 MHz and 2.0 GHz, e.g. mobile radio, stationary radio and broadcasting stations, walkie-talkies and industrial RF sources. An IT system is being disrupted if a source generates an interfering pulse exceeding the limit/immunity of the receiving equipment. Further typical external interference sources are e.g. power cables and the switching-on of fluorescent lamps.

With high-quality cabling, a new problem arises: the Alien Crosstalk (between cables adjacent to each other).

Screening: the basics

EMC defi nes the capability of a system to work without having a negative infl uence (emission of interference) on other systems.

Mostly, EMC interferences are electrically asymmetrical. That means, an interference source generates an interference that is in phase on both the neutral and live conductors with respect to earth. Regardless of the cause of interference, a symmetrical (balanced) cabling can minimize the interference when the two conductors of the symmetrical transmission channel are infl uenced in phase, as this is negated.

Screening designs

Complying with the respective EMC requirements, our screened UC cables are available in the following designs:

/ S (Screen): Overall screen of aluminium-laminated foil
/ HS (High Screen): Screened with aluminiumlaminated foil and tinned copper braid
/ SS (Super Screen): Pair screen with aluminiumlaminated foil and overall screen with tinned copper braid.

The application of highly screened cables saves modifications when installations are expanded. For you, this means a very cost effective cabling solution for now and the future.

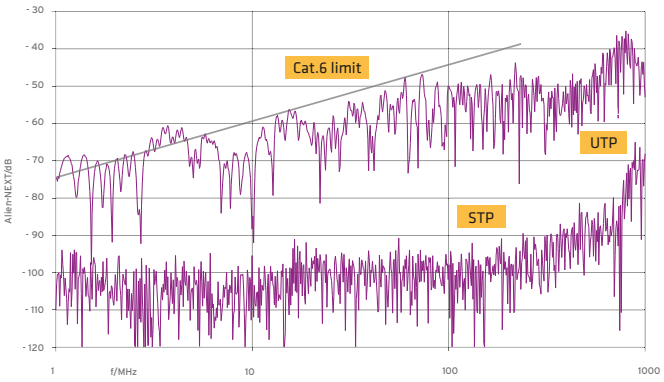
EMV
ALIEN CROSSTALK REQUIRES SCREENING

Undisturbed

More and more important in practice: The interference of reliable data transmission from mutual disturbance/ coupling of unscreened and undefined communication cables.

The degree of the mutual coupling is called “Alien Crosstalk”. Although this value is not recorded with link tests, it reduces the ACR like a normal NEXT.

At 100 MHz, the Alien Crosstalk of two unscreened Cat.6 cables laid in parallel amounts to 55 dB, whereas it reaches 95 dB with screened cables. This can be of relevance at the patch panel where tight bundling of the cabling is necessary.



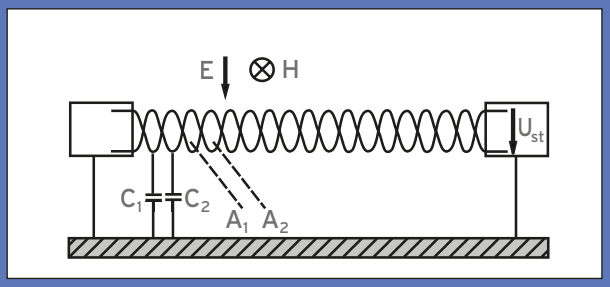
Screening classes in copper cabling

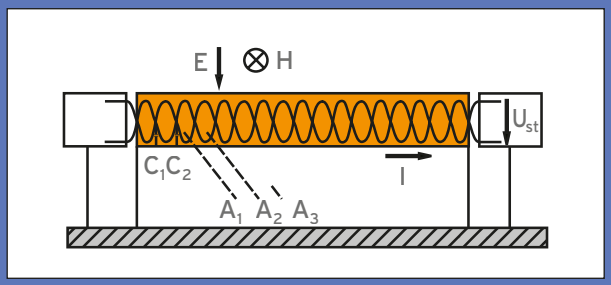
In order to judge upon the impact of screening and non-screening, parameters allowing a comparison are necessary. The application of high-quality material and the coverage of screening are decisive for an optimum screening.

Coupling attenuation and transfer impedance have been defined as screen parameters in the IEC 61156-5.

The transfer impedance – the classic cable parameter with regard to screening – alone will not help here because it is not defined for UTP cables. Its advantage is that it is only dependent on the design elements of the cable and can be specified independently of operating or environmental aspects.

The transfer model of a screened (below) and unscreened (above) conductor clearly shows: In case of an electromagnetic influence reaching the cable from outside this leads to interference due to electromagnetic induction. With relatively low frequencies, this effect may be limited by symmetric transmission elements. With high frequencies, however, a screening is essential. It conducts the interference current to the ground/earth contact and thus protects the signal-carrying conductor. The efficiency of a screen is measured as transfer impedance.





E = Electrical field
H = Magnetic field
A = Field of conductor loop
C = Grounding capacity
Ust = Interference
I = Screen current

Transfer impedance shows screening factor

Cable design	Transfer impendance		Coupling attenuation
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: 1 10 30 100	RK/mΩ/m 50 100 200 1000	Type 2: 55 dB
U/UTP	n/a		Type 3: 40 dB

Table 1: Limits for screen parameters according to IEC 61156-5

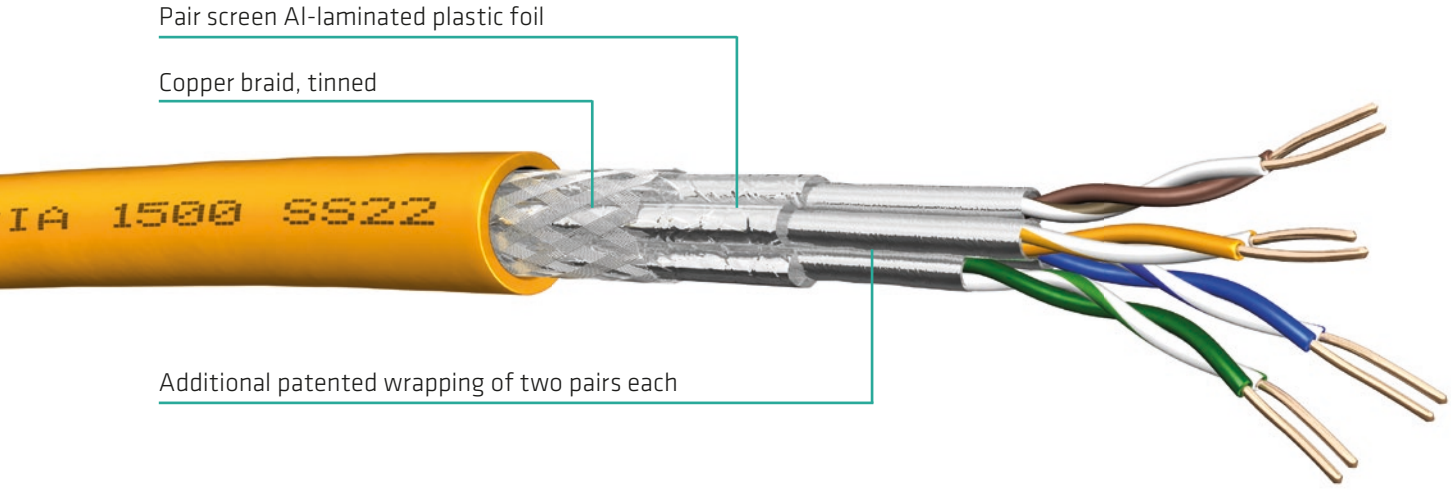
Regarding the transfer impedance, IEC 61156-5 distinguishes between Grade 1 (PiMF with braid) and Grade 2 (PiMF). However, many users fi nd this to be too abstract.

Specifically for the requirements of structured cabling, IEC 62153-4-5 has defined the parameter coupling attenuation, which defi nes a combination of the eff ect of the screen (if any) and the electrical symmetry of the conductor circuits. Thus, the coupling attenuation can be considered as application-oriented simulation of the network operation.

Table 1 shows a comparison of cable requirements designed for structured cabling in which the assignment of the cable designs to performance classes corresponds with the typical measurement results.

The above shows that a UTP cable suppresses interference voltage by a factor of 100 (= 40 dB), an S/FTP cable, however, reaches a factor of 30,000 (=85 dB).

UC MULTIMEDIA 1500 SS22 6FOILS



OPTIMUM SCREENING IN THE INSTALLATION PRACTICE

Relevance of segregation classes

Aside from general installation instructions in respect of the combined laying of power and data cables, the highly acclaimed installation standard EN 50174-2 provides criteria regarding the necessary separation distance and the application of separators in the cable trays respectively. The separation of data and power cables is described in detail in the latest version of EN 50174-2:2009 as well as the requirements and recommendations of unscreened and screened cables (see table below).

The requirements of the separation distance depend on

- Coupling attenuation (screening quality of information technology cables)
- Construction and number of circuits inside the power cables
- The existence of separators in the cable tray

Information technology cables			
Screened	Unscreened	Coaxial/tinaxial	Segregation classification
Coupling attenuation at 30 – 100 MHz	TCL at 30 – 100 MHz (dB)	Screening attenuation at 30 – 100 MHz (dB)	
≥ 80[a]	≥ 70 - 10 x lg f	≥ 85[d]	d
≥ 55[b]	≥ 60 - 10 x lg f	≥ 55	c
≥ 40	≥ 50 - 10 x lg f[c]	≥ 40	b
< 40	< 50 - 10 x lg f	< 40	a

a Cables meeting EN 50288-4-1 (EN ISO 173-1 2007, Category 7) meet segregation classification "d".

b Cables meeting EN 50288-2-1 (EN ISO 173-1 2007, Category 5) and EN 50288-5-1 (EN ISO 173-1 2007, Category 6) meet segregation classification "c". These cables may deliver performance of segregation classification "0" provided that the relevant coupling attenuation requirements are also met.

c Cables meeting EN 502-88-3-1 (EN ISO 173-1 2007, Category 5) and EN 50288-6-1 (EN ISO 173-1 2007, Category 6) meet segregation classification "b". These cables may deliver performance of segregation classification "c" and "d" provided that the relevant TCL requirements are also met.

d Cables meeting EN 50117-4-1 (EN ISO 173-1 2007, Category BCT-C) meet segregation classification "d".

Future-proof planning with UC cables of segregation classification "d"

With its UC product line, Draka offers a wide range of optimally screened installation and connection cables. Thus, the complicance with legal EMC regulations is ensured and your system is consistently protected.

Based on the respective EMC regulations, the following screened UC cables of Categories 7, 7_A and Multimedia are available in segregation classification "d" and the highest screening classes Type 1 / Grade 1.

The application of highly screened UC data cables saves adjustments in case of future upgrades. For you, this means a cost-effective cabling solution with future perspective.

Categorie	Type 1 / Grade 1 (85 dB/ 10 m/m)
7	UC900 SS23 Cat.7 S/FTP
7_A	UC1200 SS23 Cat.7_A S/FTP UC1500 SS22 Cat.7_A S/FTP
Multimedia	UC MULTIMEDIA 1500 SS23 S/FTP UC MULTIMEDIA 1500 SS22 S/FTP

PREVENTION WITH FUTURE PROSPECTS

For many years, flame retardance has been among the minimum requirements of indoor cables. Some PVC cables were often used in the past – PVC is less flammable than other materials, but they do not prevent a spread of fire. They release toxic and corrosive gases when burnt. The alternative: High-quality LSHF (Low-Smoke-Helogen-Free) materials with considerably improved properties in case of fire.

Protecting LSHF sheath

All UC cables are also available with halogenfree and flame retardant LSHF sheath. Excellent materials guarantee best electrical and mechanical properties of the cable.

The ability of our cables to avoid a spread of fire is documented by two standardized test methods: The fire characteristics of a single cable is determined according to IEC 60332-1. Test method C of IEC 60332-3- 24 tests the characteristics of cable bundles.

These tests are performed under realistic conditions in the field of structured cabling in buildings, e.g. in the distribution room or void. All our UC cables with LSHF-FR sheath fully comply with this signifi cantly stricter standard (test method C).

It is dependent on the respective building or fi eld of application whether to decide for a data transmission cable according to test method B or C.

In case of any doubt, however, security ranks first and you should prefer the data cable with the flame retardant properties.

Improved fire protection characteristics

- No spread of (fire propagation), e.g. transmission of the local fire alongside the cables
- No emission of corrosive gases, possibly creating acid with extinguishing water
- Very low smoke development
- No Dioxin in the fire remains
- Considerably low toxicology of fire gases

FIRE PROTECTION

Fire characteristics	International standard	Data cable with pvc sheath	UC-Data cable with LSHF-FR sheath
Specific fire characteristics/fire propagation of a single piece of cable	IEC 60332-1	✔	✔
Fire propagation of a cable bundle	IEC 60332-3-24		✔
Corrosivity of fire gases	IEC 60754-2		✔
Measurement of smoke density	IEC 61034-1		✔

Test method C passed

A cable bundle is exposed to a 20kW flame for 20 minutes in a 4 meter high cabinet. The cables burn within the range of the propane gas flame (up to 1 meter), however, the cable bundle extinguishes itself and the remaining cable length remains without damage: No fire propagation, no excessive smoke development which would, in case of emergency, obstruct chances to escape. For comparison: Under the same conditions, some PVC cables burn completely within 5 minutes over the entire length.

Safety

Highest precautionary measures as to the cabling apply at crowded places (e.g. hospitals, airports, schools, department stores, hotels), in buildings with a high concentration of commodity values and wherever a breakdown would involve high expenses (e.g. industrial plants, power stations, EDP centres, banks) as well as in alarm, signal and control sytems.

Material of the future

Currently, the application of fluorinated polymers as insulation material is under discussion. It is known for its extremely high thermal stability and flame retardance. However, in case of emergency this material releases highly toxic and corrosive fire gases despite the considerably improved fire resistance compared to PVC. Also in future, only LSHF materials represent a responsible alternative.

UC MULTIMEDIA
1500 SS22 6FOILS

ELECTRICAL PROPERTIES
LAN-CABLING: Cat.5e

UC300 26 Cat.5e U/UTP

Patch Cable

Transmission performance						
	MHz	1	10	100	250	300
Attenuation**	dB	0,3	0,9	3,0	4,4	4,8
NEXT	dB	71,0	56,0	41,0	35,0	34,0
PS-NEXT	dB	68,0	53,0	38,0	32,0	31,0
PS-ACR-F	dB	65,0	45,0	25,0	17,0	13,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 260	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,2
Weight kg/km	25
Fire load MJ/km	324
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 55

UC300 24 Cat.5e U/UTP

Installation Cable

Transmission performance						
	MHz	1	10	100	250	300
Attenuation**	dB	1,9	6,0	19,8	29,2	32,0
NEXT	dB	71,0	56,0	41,0	35,0	34,0
PS-NEXT	dB	68,0	53,0	38,0	32,0	31,0
ACR	dB	69,1	50,0	21,2	5,8	2,0
PS-ACR	dB	63,1	47,0	18,2	2,8	-1,2
PS-ACR-F	dB	65,0	45,0	25,0	17,0	13,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 165	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	
Coupling attenuation		
	40dB	Type III

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,0
Weight kg/km	35
Fire load MJ/km	336
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

UC300 S24 Cat.5e F/UTP

Installation Cable

Transmission performance						
	MHz	1	10	100	250	300
Attenuation**	dB	1,9	6,0	19,8	29,2	32,0
NEXT	dB	71,0	56,0	41,0	35,0	34,0
PS-NEXT	dB	68,0	53,0	38,0	32,0	31,0
ACR	dB	69,1	50,0	21,2	5,8	1,8
PS-ACR	dB	66,1	47,0	18,2	2,8	-1,2
PS-ACR-F	dB	65,0	45,0	25,0	17,0	13,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 190	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	
Transfer Impedance	mΩ/m	
1 MHz	50	Grade 2
10 MHz	100	
30 MHz	200	
Coupling attenuation		
	55 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,9
Weight kg/km	37
Fire load MJ/km	396
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 80

UC300 HS24 Cat.5e SF/UTP

Installation Cable

Transmission performance						
	MHz	1	10	100	250	300
Attenuation**	dB	1,9	6,0	19,8	29,2	32,0
NEXT	dB	71,0	56,0	41,0	35,0	34,0
PS-NEXT	dB	68,0	53,0	38,0	32,0	31,0
ACR	dB	69,1	50,0	21,2	5,8	2,0
PS-ACR	dB	66,1	47,0	18,2	2,8	-1,0
PS-ACR-F	dB	65,0	45,0	25,0	17,0	13,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 190	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	
Transfer Impedance	mΩ/m	
1 MHz	20	Grade 2
10 MHz	20	
30 MHz	30	
Coupling attenuation		
	75 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	6,4
Weight kg/km	47
Fire load MJ/km	433
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 120

ELECTRICAL PROPERTIES
LAN-CABLING: Cat.6

UC400 26 Cat.6 U/UTP

Patch Cable

Transmission performance							
	MHz	1	10	100	250	300	400
Attenuation**	dB	0,30	0,90	3,00	4,90	5,20	6,00
NEXT	dB	74,0	60,0	45,0	39,0	38,0	37,0
PS-NEXT	dB	71,0	56,0	42,0	36,0	35,0	34,0
PS-ACR-F	dB	66,0	46,0	26,0	19,0	18,0	17,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 195	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 52	

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,6
Weight kg/km	34
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 70

UC400 S27 Cat.6 U/FTP

Patch Cable

Transmission performance							
	MHz	1	10	100	250	300	400
Attenuation**	dB	0,3	1,0	3,3	5,1	5,6	6,5
NEXT	dB	87,0	72,0	57,0	51,0	50,0	48,0
PS-NEXT	dB	84,0	69,0	54,0	48,0	47,0	45,0
PS-ELFEXT	dB	72,0	72,0	52,0	44,0	42,0	40,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 340	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer Impedance	mΩ/m	
1 MHz	50	
10 MHz	100	
30 MHz	200	

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,7
Weight kg/km	26
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 70

UC400 Cat.6 U/UTP HD

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Transmission performance							
	MHz	1	10	100	250	300	400
Attenuation**	dB	1,9	6,0	19,1	32,0	36,1	42,7
NEXT	dB	78,0	63,0	48,0	42,0	41,0	39,0
PS-NEXT	dB	75,0	60,0	45,0	39,0	38,0	36,0
ACR	dB	76,1	57,0	28,9	12,0	4,8	-2,7
PS-ACR	dB	73,1	54,0	25,9	9,0	1,8	-5,7
PS-ELFEXT	dB	80,0	60,0	40,0	32,0	30,0	28,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 176	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	
Coupling attenuation		
	40 dB	Type III

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,3
Weight kg/km	36
Fire load MJ/km	316
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

UC400 S23 Cat.6 U/FTP

Installation Cable

Transmission performance							
	MHz	1	10	100	250	300	400
Attenuation**	dB	0,8	5,4	17,4	28,8	30,9	38,3
NEXT	dB	100	100	100	90	89	87
PS-NEXT	dB	97	97	97	97	86	84
ACR	dB	98	95	83	62	58	48
PS-ACR	dB	95	92	80	59	55	45
PS-ELFEXT	dB	102	94	74	66	64	61

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 145	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 45	
Transfer Impedance	mΩ/m	
1 MHz	50	Grade 2
10 MHz	100	
30 MHz	200	
Coupling attenuation		
	75 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	7,3
Weight kg/km	45
Fire load MJ/km	542
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

*Nominal value measured at 100m (Velocity of Propagation)
** Nominal value Patch Cable measured at 10m
*** NVP = Nominal
**** LSHF (FRNC)

ELECTRICAL PROPERTIES
LAN-CABLING: Cat.6$_A$

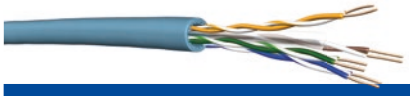
UC500 S27 Cat.6$_A$ U/FTP
Patch Cable

Transmission performance								
	MHz	1	10	100	250	300	400	500
Attenuation**	dB	0,3	1,0	3,3	5,1	5,6	6,5	7,3
NEXT	dB	87,0	72,0	57,0	51,0	50,0	48,0	46,0
PS-NEXT	dB	84,0	69,0	54,0	48,0	47,0	45,0	43,0
PS-ACR-F	dB	72,0	72,0	52,0	44,0	42,0	40,0	37,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 340	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	50	
10 MHz	100	
30 MHz	200	

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,7
Weight kg/km	26
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 50

UC500 23 Cat.6$_A$ U/UTP
Installation Cable

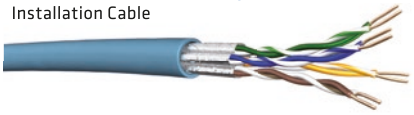


Transmission performance							
	MHz	1	10	100	250	300	500
Attenuation**	dB	2,1	5,9	19,1	31,1	34,2	45,3
NEXT	dB	75,3	60,3	45,3	39,3	38,1	34,8
PS-NEXT	dB	72,3	57,3	42,3	36,3	35,1	31,8
PS-ACR-F	dB	65,0	45,0	25,0	17,0	15,5	11,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 145	
NVP*** %	ca. 67	
Capacitance	nF/km nom. 48	
Coupling attenuation		
	40 dB	Type III

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,7
Weight kg/km	26
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

UC500 S23 Cat. 6$_A$ U/FTP
Installation Cable



Transmission performance								
	MHz	1	10	100	250	300	400	500
Attenuation**	dB	1,8	5,4	17,4	28,1	30,9	38,3	44,8
NEXT	dB	100,0	100,0	100,0	90,0	89,0	87,0	85,0
PS-NEXT	dB	97,0	97,0	97,0	87,0	86,0	84,0	82,0
ACR	dB	98,0	95,0	83,0	62,0	58,0	48,0	40,0
PS-ACR	dB	95,0	92,0	80,0	59,0	55,0	45,0	37,0
PS-ACR-F	dB	102,0	94,0	74,0	66,0	64,0	61,0	58,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 176	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 45	
Transfer impedance	mΩ/m	
1 MHz	50	Grade 2
10 MHz	100	
30 MHz	200	
Coupling attenuation		
	55 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,7
Weight kg/km	26
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

UC500 AS23 Cat.6$_A$ F/FTP
Installation Cable

Transmission performance								
	MHz	1	10	100	250	300	400	500
Attenuation**	dB	1,8	5,4	17,4	28,1	30,9	38,3	44,8
NEXT	dB	100,0	100,0	100,0	90,0	89,0	87,0	85,0
PS-NEXT	dB	97,0	97,0	97,0	87,0	86,0	84,0	82,0
ACR	dB	98,0	95,0	83,0	62,0	58,0	48,0	40,0
PS-ACR	dB	95,0	92,0	80,0	59,0	55,0	45,0	37,0
PS-ACR-F	dB	102,0	94,0	74,0	66,0	64,0	61,0	58,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 176	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 45	
Transfer impedance	mΩ/m	
1 MHz	50	Grade 2
10 MHz	100	
30 MHz	200	
Coupling attenuation		
	75w dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,7
Weight kg/km	26
Fire load MJ/km	342
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

ELECTRICAL PROPERTIES
LAN-CABLING: Cat.7

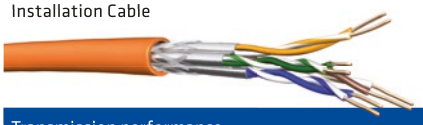
UC900 SS27 Cat.7 S/FTP
Patch Cable

Transmission performance										
	MHz	1	10	100	250	300	450	600	1000
Attenuation**	dB	0,3	1,0	3,2	5,1	5,6	6,9	7,9	10,2
NEXT	dB	90,0	90,0	87,0	81,0	80,0	77,0	75,0	71,0
PS-NEXT	dB	87,0	87,0	84,0	78,0	77,0	74,0	72,0	68,0
PS-ACR-F	dB	77,0	77,0	57,0	49,0	47,0	44,0	41,0	37,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 340	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	25	
10 MHz	15	
30 MHz	30	

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	5,9
Weight kg/km	39
Fire load MJ/km	349
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 100

UC900 HS23 Cat.7 S/FTP
Installation Cable



Transmission performance										
	MHz	1	10	100	250	300	450	600	1000
Attenuation**	dB	1,8	5,4	17,4	28,1	30,9	38,3	44,8	63,1
NEXT	dB	100,0	100,0	100,0	90,0	89,0	87,0	85,0	80,0
ACR	dB	97,0	97,0	97,0	87,0	86,0	84,0	82,0	77,0
PS-NEXT	dB	98,0	95,0	83,0	62,0	58,0	48,0	40,0	17,0
PS-ACR	dB	95,0	92,0	80,0	59,0	55,0	45,0	37,0	14,0
PS-ACR-F	dB	105,0	94,0	74,0	66,0	64,0	61,0	58,0	54,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 165	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	12	Grade 2
10 MHz	10	
30 MHz	30	
Coupling attenuation		
	80 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	7,4
Weight kg/km	54,5
Fire load MJ/km	590
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 110

UC900 SS23 Cat.7 S/FTP
Installation Cable

Transmission performance										
	MHz	1	10	100	250	300	450	600	1000
Attenuation**	dB	1,8	5,4	17,4	28,1	30,9	38,3	44,8	63,1
NEXT	dB	104,0	100,0	100,0	90,0	89,0	87,0	85,0	80,0
ACR	dB	97,0	97,0	97,0	87,0	86,0	84,0	82,0	77,0
PS-NEXT	dB	98,0	95,0	83,0	62,0	58,0	48,0	40,0	17,0
PS-ACR	dB	95,0	92,0	80,0	59,0	55,0	45,0	37,0	14,0
PS-ACR-F	dB	105,0	94,0	74,0	66,0	64,0	61,0	58,0	54,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 150	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	5	Grade 1
10 MHz	5	
30 MHz	10	
Coupling attenuation		
	85 dB	Type I

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	7,5
Weight kg/km	75
Fire load MJ/km	585
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 340

* Nominal value measured at 100m (Velocity of Propagation)
**Nominal value Patch Cable measured at 10m
NVP = Nominal I * LSHF (FRNC)

ELECTRICAL PROPERTIES
LAN-CABLING: Cat.7$_A$

UC1200 SS23 Cat.7$_A$ S/FTP
Installation Cable

Transmission performance										
	MHz	1	10	100	250	300	600	1000	1200
Attenuation**	dB	1,8	5,4	17,4	28,1	30,9	44,8	58,4	65,2
NEXT	dB	100,0	100,0	100,0	90,0	87,0	85,0	82,0	82,0
PS-NEXT	dB	97,0	97,0	97,0	87,0	86,0	82,0	79,0	79,0
ACR	dB	98,0	95,0	83,0	87,0	86,0	40,0	24,0	17,0
PS-ACR	dB	95,0	92,0	80,0	59,0	55,0	37,0	21,0	14,0
PS-ACR-F	dB	105,0	94,0	74,0	66,0	64,0	58,0	54,0	40,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 133	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 44	
Transfer impedance	mΩ/m	
1 MHz	5	Grade 1
10 MHz	5	
30 MHz	10	
Coupling attenuation		
	85 dB	Type I

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	7,8
Weight kg/km	65
Fire load MJ/km	589
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 340

UC1500 SS22 Cat.7$_A$ S/FTP
Installation Cable

Transmission performance										
	MHz	1	10	100	250	600	1000	1200	1400	1500
Attenuation**	dB	1,7	5,1	16,3	25,8	40,2	52,1	57,1	61,3	64,1
NEXT	dB	100	100	100	90	85	83	83	81	80
ACR	dB	98	95	83	64	45	31	26	21	16
PS-NEXT	dB	97	97	97	87	82	80	80	78	77
PS-ACR	dB	95	92	80	61	42	28	23	18	13
PS-ACR-F	dB	97	92	77	66	42	37	32	27	25

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 128	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	5	Grade 1
10 MHz	5	
30 MHz	10	
Coupling attenuation		
	85 dB	Type I

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	8,5
Weight kg/km	73
Fire load MJ/km	674
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 340

UC1500 HS22 Cat.7$_A$ S/FTP
Installation Cable

Transmission performance										
	MHz	1	10	100	250	600	1000	1200	1400	1500
Attenuation**	dB	1,7	5,1	16,3	25,8	40,2	52,1	57,1	61,3	64,1
NEXT	dB	100	100	100	90	85	83	83	81	80
ACR	dB	98	95	83	64	45	31	26	21	16
PS-NEXT	dB	97	97	97	87	82	80	80	78	77
PS-ACR	dB	95	92	80	61	42	28	23	18	13
PS-ACR-F	dB	97	92	77	66	42	37	32	27	25

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 128	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	12	Grade 2
10 MHz	10	
30 MHz	30	
Coupling attenuation		
	80 dB	Type II

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	8,5
Weight kg/km	62
Fire load MJ/km	674
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 140

UC MULTIMEDIA 1500 SS22 6 FOILS S/FTP
Installation Cable

Transmission performance								
	MHz	1	10	100	250	600	1000	1500
Attenuation**	dB	1,7	5,1	16,3	25,8	40,2	52,1	64,1
NEXT	dB	115,0	115,0	110,0	105,0	100,0	96,0	94,0
PS-NEXT	dB	112,0	112,0	108,0	102,0	97,0	93,0	91,0
ACR	dB	113,0	110,0	95,0	80,0	60,0	44,0	30,0
PS-ACR	dB	110,0	107,0	92,0	77,0	57,0	41,0	27,0
PS-ELFEXT	dB	102,0	94,0	74,0	66,0	58,0	54,0	50,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	≤ 110	
NVP*** %	ca. 79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	5	Grade 1
10 MHz	2	
30 MHz	2	
Coupling attenuation		
	85 dB	Type I

Mechanical properties	
Fire protection characteristics****	
Overall diameter mm	8,9
Weight kg/km	86
Fire load MJ/km	746
Bending radius	
with load	8xD
without load	4xD
Tensile force	N 380

ELECTRICAL PROPERTIES
DATA CENTRE & LAN-CABLING: Cat8.2

UC[FUTURE] COMPACT22 Cat8.2 S/FTP 1600MHz

Installation Cable

Transmission performance									Electrical properties			Mechanical properties	
	MHz	1	10	100	250	600	1000	1600	Impedance Ω	100 ± 5		Fire protection characteristics****	
Attenuation**	dB	1,8	5,1	16,7	27,2	44,0	58,8	77,4	Loop resistance Ω/km	130		Overall diameter mm	8,5
NEXT	dB	100,0	100,0	100,0	90,0	85,0	83,0	75,0	NVP*** %	73		Weight kg/km	75
PS-NEXT	dB	97,0	97,0	97,0	87,0	82,0	80,0	72,0	Capacitance	nF/km nom. 43		Fire load MJ/km	674
ACR	dB	98,2	94,9	83,3	62,8	41,0	24,2	-2,4	Transfer impedance	mΩ/m		Bending radius	
PS-ACR-F	dB	97,0	92,0	77,0	67,0	57,0	52,0	48,0	1 MHz	5	Grade 1	with load	8xD
									10 MHz	5		without load	4xD
									30 MHz	10		Tensile force	N 340
									Coupling attenuation				
										85 dB	Type I		

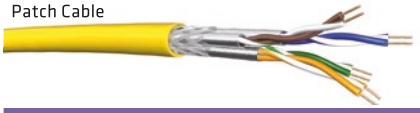
UC[FUTURE] COMPACT22 Cat8.2 S/FTP 2000MHz

Installation Cable

Transmission performance										Electrical properties			Mechanical properties	
	MHz	1	10	100	250	600	1000	1600	2000	Impedance Ω	100 ± 5		Fire protection characteristics****	
Attenuation**	dB	1,8	5,1	16,7	27,2	44,0	58,8	77,4	88,4	Loop resistance Ω/km	130		Overall diameter mm	8,5
NEXT	dB	100,0	100,0	100,0	90,0	85,0	83,0	75,0	70,0	NVP*** %	73		Weight kg/km	80
PS-NEXT	dB	97,0	97,0	97,0	87,0	82,0	80,0	72,0	69,0	Capacitance	nF/km nom. 43		Fire load MJ/km	674
ACR	dB	98,2	94,9	83,3	62,8	41,0	24,2	-2,4	-18,4	Transfer impedance	mΩ/m		Bending radius	
PS-ACR-F	dB	97,0	92,0	77,0	67,0	57,0	52,0	48,0	47,0	1 MHz	5	Grade 1	with load	8xD
										10 MHz	5		without load	4xD
										30 MHz	10		Tensile force	N 340
										Coupling attenuation				
											85 dB	Type I		

UC[FUTURE] COMPACT26/7 Cat8.2 S/FTP 2000MHz

Patch Cable



Transmission performance										Electrical properties			Mechanical properties	
	MHz	1	10	100	250	600	1000	1600	2000	Impedance Ω	100 ± 5		Fire protection characteristics****	
Attenuation**	dB	0,3	0,9	2,8	4,5	7,1	9,3	12,0	13,6	Loop resistance Ω/km	280		Overall diameter mm	6,0
NEXT	dB	78,0	78,0	75,4	69,4	63,7	60,4	57,3	55,9	NVP*** %	73		Weight kg/km	38
PS-NEXT	dB	75,0	75,0	72,4	66,4	60,7	57,4	54,3	53,9	Capacitance	nF/km nom. 43		Fire load MJ/km	296
ACR	dB	74,9	69,3	47,6	24,8	-6,9	-32,5	-62,7	-79,9	Transfer impedance	mΩ/m		Bending radius	
PS-ACR-F	dB	75	75,0	57,6	49,6	42,0	37,6	33,5	31,6	1 MHz	25	Grade 2	with load	8xD
										10 MHz	15		without load	4xD
										30 MHz	30		Tensile force	N 100
										Coupling attenuation				
											70 dB	Type II		

* Nominal value measured at 100m (Velocity of Propagation)
**Nominal value Patch Cable measured at 10m
NVP = Nominal I * LSHF (FRNC)

DATA CENTRE-CABLING

Under this heading we are introducing a series of dedicated cables use inside a data centre. The cables are a subset of the UC^{FUTURE} portfolio of cables for data centres.

UC^{FUTURE}

The future is here now in the form of the newly published IEEE 802.3 standards for 40 GbE and 100 GbE Ethernet transmission standards. The UC^{FUTURE} line of products is highly specialised copper and fibre products for use inside data centres.

They are compact multi-way cables for high density cabling. The ever increasing demand for transmission of data inside a data centre requires more cable and more fibre. Space is always in limited supply so the cables need to be compact and easy to install.

The high density UC^{FUTURE} copper solution in AWG26 conductor offers you:

/ 100% more cabling density
/ 55% less weight!
/ 40% less fire load!

The operating distance is reduced by 60 m instead of 90 m for the standard permanent link.

DATA CENTRE-CABLING: CAT. 6$_A$

Applications

Data centre cabling 10Gbit solution. Pair screened 100 Ohms cable especially for Zone Distribution Area and Equipment Distribution Area. Fulfils the requirements of Channel E$_A$ to a minimum with conductor diameter of AWG26 for transmission lengths of maximum 70 meters in the channel.

UC^{FUTURE} LOOMED^{ZD} 26 Cat.6$_A$ U/FTP 6x4P LSHF

Product name	Link length	Design	Cable diameter
UC^{FUTURE} LOOMED^{ZD} 26 Cat.6$_A$ U/FTP 6x4P LSHF	60m	6X4P	15,1 mm
UC^{FUTURE} LOOMED 23 Cat.6$_A$ U/FTP 6x4P LSHF	80m	6X4P	18,5 mm

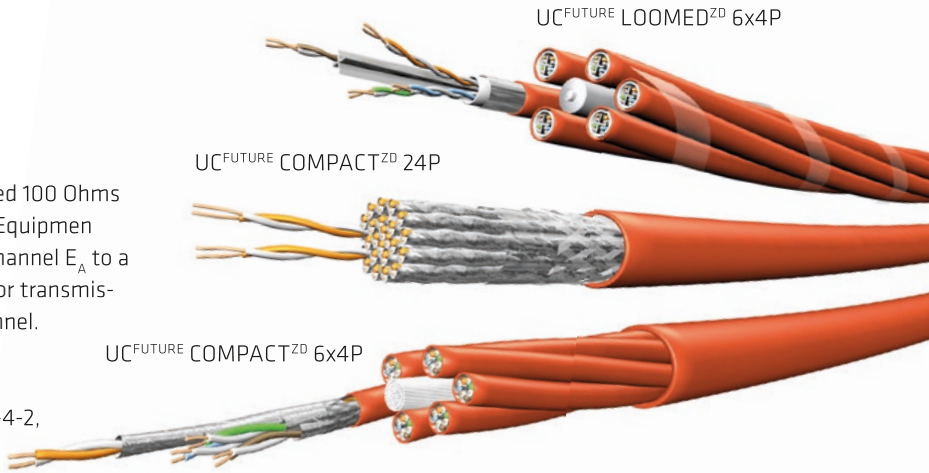
Transmission performance						
	MHz	1	10	100	250	500
Attenuation**	dB	1,8	5,4	17,4	28,1	43,0
NEXT	dB	100,0	100,0	100,0	90,0	86,0
PS-NEXT	dB	97,0	97,0	97,0	87,0	83,0
ACR	dB	98,0	95,0	83,0	62,0	43,0
PS-ACRF	dB	102,0	94,0	74,0	66,0	58,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	176	
NVP*** %	79	
Capacitance	nF/km nom. 43	
Transfer impedance	mΩ/m	
1 MHz	50	Grade 2
10 MHz	100	
30 MHz	200	
Coupling attenuation		
	55 dB	Type II

Mechanical properties	
Fire protection charact.****	
Overall diameter mm	15,1 mm
Weight kg/km	188
Fire load MJ/km	674
Bending radius	
with load	8xD
without load	4xD
Tensile force	N600

* Nominal value measured at 100m (Velocity of Propagation)
**Nominal value Patch Cable measured at 10m
NVP = Nominal l * LSHF (FRNC)

DATA CENTRE-CABLING: CAT.7



Applications

Data centre cabling 10Gbit solution. Pair screened 100 Ohms cable especially for Zone Distribution Area and Equipmen Distribution Area. Fulfils the requirements of Channel E_A to a minimum with conductor diameter of AWG26 for transmission lengths of maximum 70 meters in the channel.

Compliance

EN 50173-5, TIA-942, ISO/IEC 24764, EN 50288-4-2, IEC61156-6, ISO/IEC 11801 2nd edition

UC FUTURE AWG26 range for 60m link length:			
Product name	Design	Cable diameter	
UC FUTURE COMPACT ZD 26 Cat.7 S/FTP 24P LSHF	24P	13,9 mm	
UC FUTURE COMPACT ZD 26 Cat.7 S/FTP 6x4P LSHF	6X4P	19,2 mm	
UC FUTURE LOOMED ZD 26 Cat.7 S/FTP 6x4P LSHF	6X4P	16,4 mm	

Transmission performance						
	MHz	1	10	100	250	600
Attenuation**	dB	0,3	5,1	16,3	25,8	40,2
NEXT	dB	90,0	115,0	110,0	105,0	100,0
PS-NEXT	dB	87,0	112,0	108,0	102,0	97,0
ACR-ACRF	dB	77,0	110,0	95,0	80,0	60,0

Electrical properties		
Impedance Ω	100 ± 5	
Loop resistance Ω/km	280	
NVP*** %	76	
Capacitance	nF/km nom. 44	
Transfer impedance	mΩ/m	
1 MHz	5	Grade 1
10 MHz	5	
30 MHz	10	
Coupling attenuation		
	85 dB	Type I

UC FUTURE AWG23 range for 80m link length:			
Product name	Design	Cable diameter	
UC FUTURE COMPACT 23 Cat.7 S/FTP 24P LSHF	24P	18,0 mm	
UC FUTURE COMPACT 23 Cat.7 S/FTP 6x4P LSHF	6X4P	25,0 mm	
UC FUTURE LOOMED 23 Cat.7 S/FTP 6x4P LSHF	6X4P	22,1 mm	

PRODUCT SCOPE UC DATA TRANSMISSION

LAN-Cabling

Cable type	Screening	Category	Application
UC300 24 Cat.5e U/UTP	U/UTP	Cat.5e	Installation Cable
UC300 S24 Cat.5e F/UTP	F/UTP	Cat.5e	Installation Cable
UC300 HS24 Cat.5.e SF/UTP	SF/UTP	Cat.5e	Installation Cable
UC400 Cat.6 U/UTP HD	U/UTP	Cat.6	Installation Cable
UC400 S23 Cat.6 U/FTP *	U/FTP	Cat.6	Installation Cable
UC400 HS23 Cat.6 S/FTP *	S/FTP	Cat.6	Installation Cable
UC500 23 Cat.6_A U/UTP *	U/UTP	Cat.6_A	Installation Cable
UC500 S23 Cat.6_A U/FTP *	U/FTP	Cat.6_A	Installation Cable
UC500 AS23 Cat.6_A F/FTP *	F/FTP	Cat.6_A	Installation Cable
UC900 HS23 Cat.7 S/FTP	S/FTP	Cat.7	Installation Cable
UC900 SS23 Cat.7 S/FTP	S/FTP	Cat.7	Installation Cable
UC1200 SS23 Cat.7_A S/FTP	S/FTP	Cat.7_A	Installation Cable
UC1200 HS23 Cat.7_A S/FTP	S/FTP	Cat.7_A	Installation Cable
UC1500 SS22 Cat.7_A S/FTP	S/FTP	Cat.7_A	Installation Cable
UC1500 HS22 Cat.7_A S/FTP	S/FTP	Cat.7_A	Installation Cable
UC MULTIMEDIA 1500 SS23 6FOILS S/FTP *	S/FTP	Cat.7_A	Installation Cable
UC MULTIMEDIA 1500 SS22 6FOILS S/FTP *	S/FTP	Cat.7_A	Installation Cable

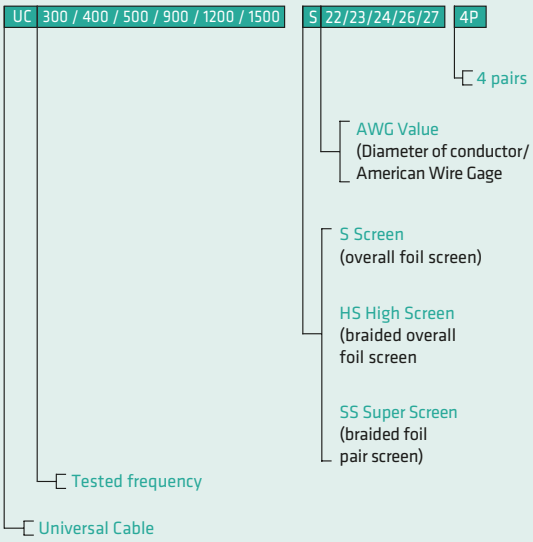
* Draka patent designs

Data Centre & LAN-Cabling: Cat8.2

Cable type	Screening	Category	Application
UC^{FUTURE} COMPACT22 Cat8.2 S/FTP 1600MHz	S/FTP	Cat8.2	Installation Cable
UC^{FUTURE} COMPACT22 Cat8.2 S/FTP 2000MHz	S/FTP	Cat8.2	Installation Cable
UC^{FUTURE} COMPACT26/7 Cat8.2 S/FTP 2000MHz Patch	S/FTP	Cat8.2	Patch Cable

Data Centre-Cabling

Cable type	Screening	Category	Design	AWG
UC^{FUTURE} LOOMED^{ZD} 26 Cat.6_A U/FTP 6x4P LSHF	U/FTP	Cat.6_A	6x4P	26
UC^{FUTURE} LOOMED 23 Cat.6_A U/FTP 6x4P LSHF	U/FTP	Cat.6_A	6x4P	23
UC^{FUTURE} COMPACT^{ZD} 26 Cat.7 S/FTP 24P LSHF	U/FTP	Cat.7	24P	26
UC^{FUTURE} COMPACT^{ZD} 26 Cat.7 S/FTP 6x4P LSHF	U/FTP	Cat.7	6x4P	26
UC^{FUTURE} LOOMED^{ZD} 26 Cat.7 S/FTP 6x4P LSHF	U/FTP	Cat.7	6x4P	26
UC^{FUTURE} COMPACT^{ZD} 23 Cat.7 S/FTP 24P LSHF	U/FTP	Cat.7	24P	23
UC^{FUTURE} COMPACT^{ZD} 23 Cat.7 S/FTP 6x4P LSHF	U/FTP	Cat.7	6x4P	23
UC^{FUTURE} LOOMED^{ZD} 23 Cat.7 S/FTP 6x4P LSHF	U/FTP	Cat.7	6x4P	23



100-Ω-data transmission cables according to: ISO/IEC11801 2nd ed./ EN 50173 Cat.5e, Class D; Cat.6, Class E; Cat.6_A, Class E_A; Cat.7, Class F; Cat.7_A, Class II; Cat8.2

UC300 Universal Cable 100 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC400 Universal Cable 250 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC500 Universal Cable 500 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC900 Universal Cable 600 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC1200 Universal Cable 1000 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC1500 Universal Cable 1000 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

UC MULTIMEDIA
Universal Cable 1000 MHz
according to ISO/IEC 11801 2nd ed./EN 50173

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/ Home Networks
/ Industry
/ Studio
/ CATV
/ Long-distance networks
/ Subscribers networks (FttX)
/ Telecommunication networks
/ Mobile telephone systems
/ OPGW
/ Signalling cables

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