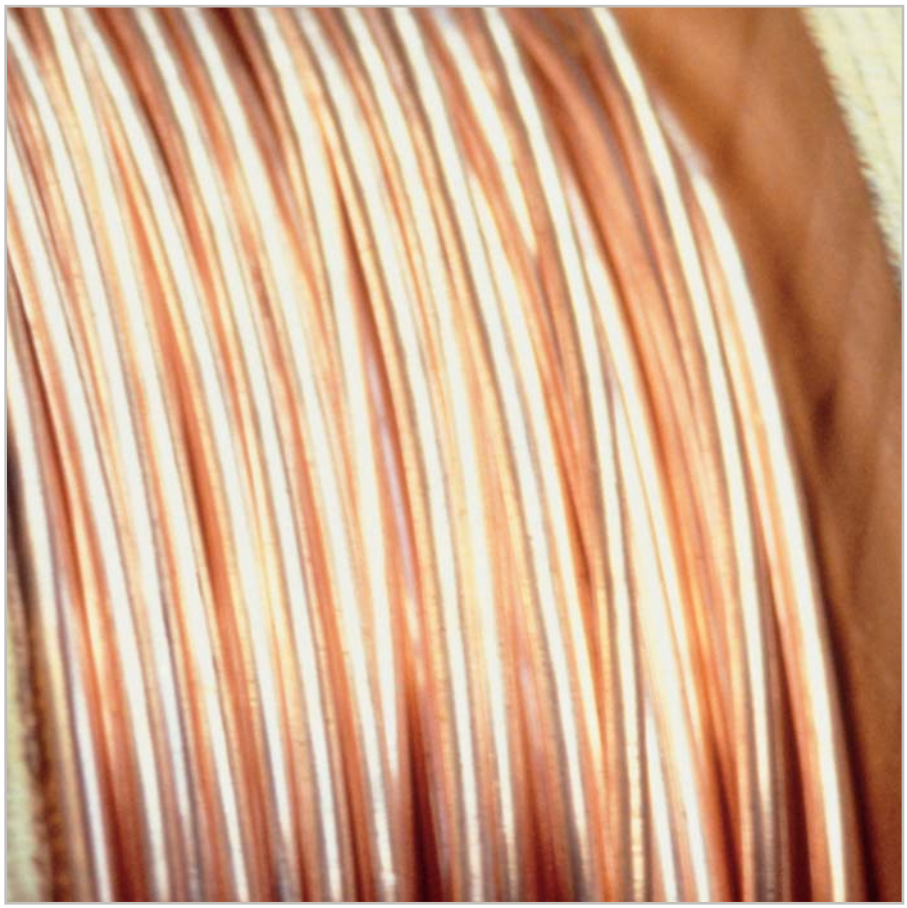
LANscape® Solutions

FutureCom™
Shielded Copper Cabling Systems

2008/09



CORNING

1	Introduction	3
2	FutureCom™ F	13
3	FutureCom™ 10TENe	53
4	FutureCom™ 10TEN	77
5	FutureCom™ E	103
6	FutureCom™ D	135
7	Data Centre Solutions	161
8	FutureCom™ Hardware	181
9	FutureCom™ Telephone / ISDN Products	213
10	FutureCom™ Industrial	219
11	Media Converter Module	243
12	Tools and Accessories	249
13	FutureCom™ Flex Wire Cables	253
14	FutureCom™ Special Cables	259
15	Further Information	269

1 Introduction

1.1. Corning - Your reliable and competent partner 4

1.2. Corning Cable Systems: Global Cable and Hardware Businesses 6

1.3. Corning Quality 8

1.4. Standards for structured Premises Cabling Solutions 9

1.5. LANscape® - Structured Cabling according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) 10

Corning - Your reliable and competent partner

Corning Incorporated is a renowned world leader in converting materials science into products that improve people's lives. Our ingenuity is unmatched – for more than 150 years we have been working to improve the world through innovation. Over the years Corning has developed a large number of pioneering technologies. The company has provided glass for affordable, high-resolution screens in laptop and desktop computers, LCD TVs and other electronic devices, glass fibre for networks that revolutionise the speed and quality at which speech and data are transmitted, the world's first mass-produced light bulb to light up the world, mass-produced TV tubes to bring entertainment to homes around the world, and highly-efficient vehicle emission filters to clean the air. Corning optical fibre has been defining standards for products and technological expertise in the fibre optics industry ever since we invented the world's first low-loss optical fibre for communication purposes over thirty years ago. Today Corning continues to concentrate on growth markets where technology plays a crucial role in commercial success. Working closely with our customers enables us to maintain the lead in a variety of different markets, including telecommunications, display technologies, environmental technologies and life sciences.

Corning is a reliable partner that fulfils every communication demand of its customers in the entire world with low-cost system solutions. As one of the very first companies in the area of fibre optic cable technology, Corning has an irreplaceable wealth of knowledge.

Corning - Highlights of the History

1851

Corning Glass Works is founded

1908

Corning Glass Works begins to produce glass bulbs for Thomas Edison's light bulbs

1932

Corning cuts the world's largest piece of glass for a telescope mirror

1947

Corning invents a process for mass-producing glass TV tubes

In 2000, Corning brought together its entire cable, hardware and equipment business as Corning Cable Systems. Today, Corning Cable Systems includes what once was the Siecor Corporation, the communication cables business of BICC (Corning Cables), Siemens' former Communication Cables division, and RXS Kabelgarnituren.

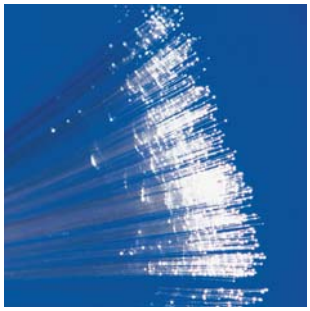
In 1974, when fibre optic technology was still in its infancy, Corning was already testing fibre optic lines with leading common carriers in Europe. 1977 saw the first fibre optic line for Deutsche Telekom in Berlin. When the first US projects followed in 1979, the business became global, taking on numerous ambitious projects.
Corning Cable Systems stands for technical expertise, outstanding product quality, and customized services. Having sold over 25 million miles of fibre optic cable worldwide, Corning is the market leader. This is experience our customers can trust. As manufacturers of passive cabling systems, we offer our customers more than individual products – we offer them complete fibre optic and copper cabling solutions from a single source.

Our quality and environmental management systems are certified under DIN EN ISO 9001 and ISO 14001.

Corning. Always the right solution.

1961

Corning produces heat-resistant windows for Mercury, the US's first manned spacecraft

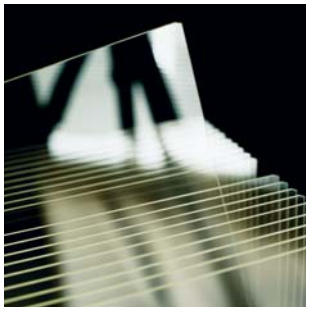


1970

Corning invents the first low-loss optical fibre

1972

Corning invents the honeycomb-shaped ceramic material for catalytic converters



1994

Corning presents an aluminum silicate glass that becomes the leading glass substrate for active matrix LCD screens

Corning Cable Systems:

Global Cable and Hardware Businesses

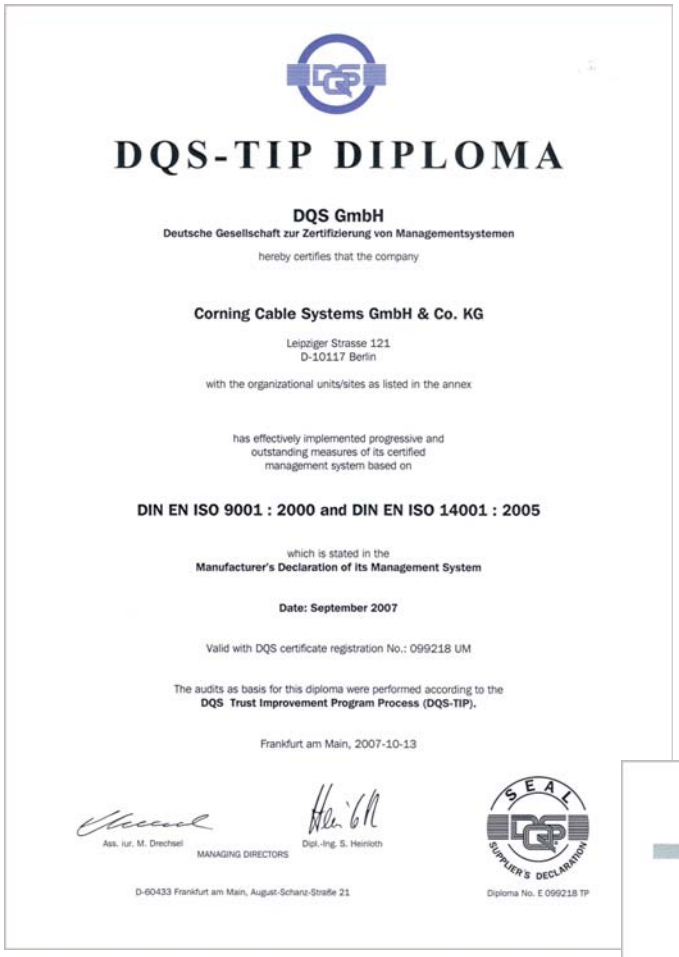
Legend

- ■ Manufacturing Location
- ▲ Business Location
- ⬮ Engineering & Project Services Location
- ✻ Divisional Headquarters
- ♦ Regional Commercial and Administration Center
- ■ Equity Company Manufacturing Location
- ▲ Equity Company Business Location

Icons for some business locations represent several similar locations within the same geographical area


Germany ■
, Germany▲■⬮
Germany▲■
Samara, Russia ■
any♦▲⬮
Moscow, Russia▲■
kow, Poland ■
olin, Poland ■
Gebze, Turkey ■▲
Dubai, UAE▲
Beijing, China ■
Chengdu, China ■
Hitachi City, Japan ■
Tokyo, Japan ▲
Shanghai, China ♦
SHCCS ■
Singapore, Singapore ♦▲⬮
Clayton, Australia ▲■⬮

Corning Quality



DQS-TIP DIPLOMA

DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsystemen

hereby certifies that the company

Corning Cable Systems GmbH & Co. KG

Leipziger Strasse 121
D-10117 Berlin

with the organizational units/sites as listed in the annex

has effectively implemented progressive and outstanding measures of its certified management system based on

DIN EN ISO 9001 : 2000 and DIN EN ISO 14001 : 2005

which is stated in the
Manufacturer's Declaration of its Management System

Date: September 2007

Valid with DQS certificate registration No.: 099218 UM

The audits as basis for this diploma were performed according to the
DQS Trust Improvement Program Process (DQS-TIP).

Frankfurt am Main, 2007-10-13

Ass. iur. M. Drechsel — Dipl.-Ing. S. Heinloth
MANAGING DIRECTORS

D-60433 Frankfurt am Main, August-Schanz-Straße 21

SEAL DQS SUPPLIER'S DECLARATION
Diploma No. E 099218 TP

IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and
DQS GmbH Deutsche Gesellschaft zur Zertifizierung von Managementsystemen
hereby certify that the company

Corning Cable Systems GmbH & Co. KG

Leipziger Strasse 121
D-10117 Berlin

with the organizational units/sites as listed in the annex

for the scope

Development, production assembling, sales, field engineering as well as services related to cables and accessories for all applications in communication networks

has implemented and maintains a

Quality and Environmental Management System.

An audit, documented in a report, has verified that this management system fulfills the requirements of the following standards:

ISO 9001 : 2000 and ISO 14001 : 2004

This certificate is valid until 2010-10-12

Frankfurt am Main 2007-10-13

Registration Number: DE-099218 QM UM

IQNet — René Wasmer, President of IQNet; Ass. iur. M. Drechsel, S. Heinloth, Managing Directors of DQS GmbH

IQNet Partners*:

AENOR *Spain* AFAQ AFNOR *France* AIB-Vincotte International *Belgium* ANCE *Mexico* APCER *Portugal* CISQ *Italy* CQC *China* CQM *China* CQS *Czech Republic* Cro Cert *Croatia* DQS *Germany* DS *Denmark* ELOT *Greece* FCAV *Brazil* FONDONORMA *Venezuela* HKQAA *Hong Kong China* ICONTEC *Colombia* IMNC *Mexico* Inspecta Certification *Finland* IRAM *Argentina* JQA *Japan* KFQ *Korea* MSZT *Hungary* Nemko AS *Norway* NSAI *Ireland* PCBC *Poland* QMI *Canada* Quality Austria *Austria* RR *Russia* SAI Global *Australia* SII *Israel* SIQ *Slovenia* SIRIM QAS International *Malaysia* SQS *Switzerland* SRAC *Romania* TEST St Petersburg *Russia* YUQS *Serbia*

IQNet is represented in the USA by: AFAQ AFNOR, AIB-Vincotte International, CISQ, DQS, NSAI Inc., QMI and SAI Global

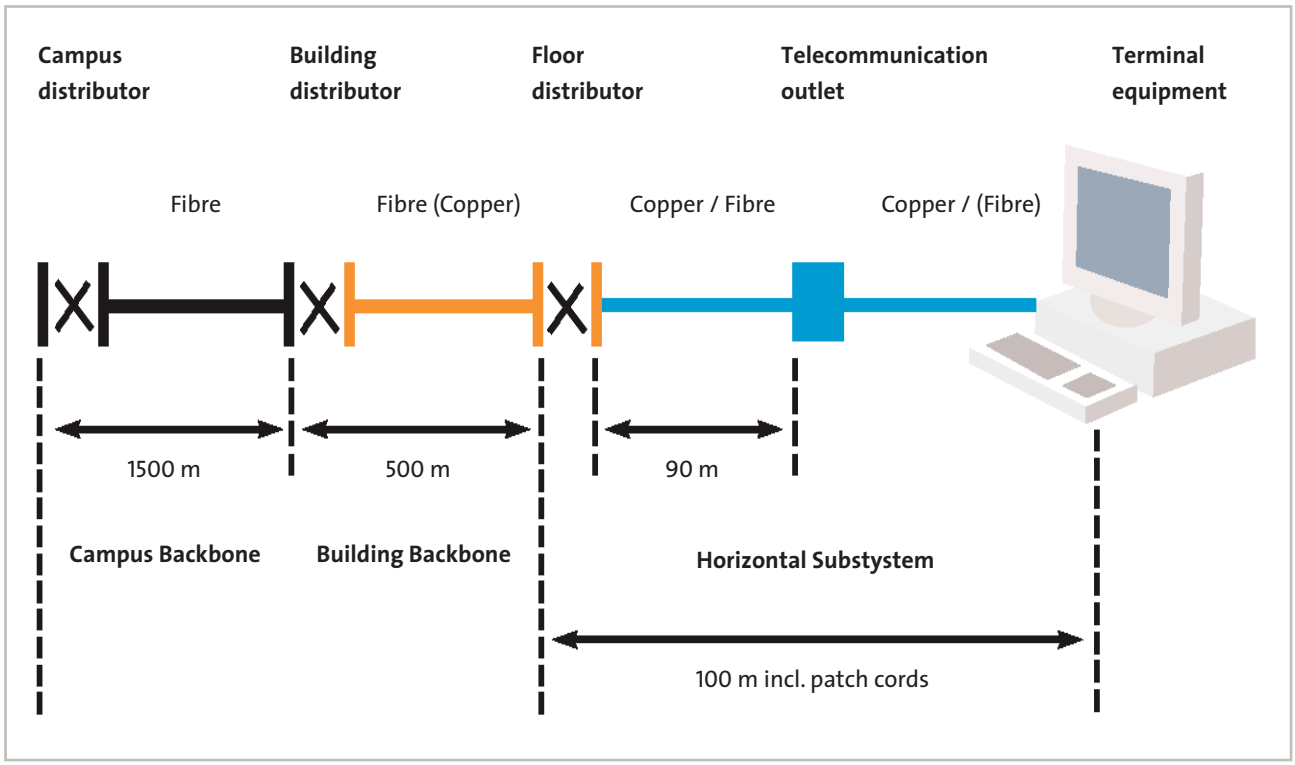
* The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

Standards for structured Premises Cabling Solutions

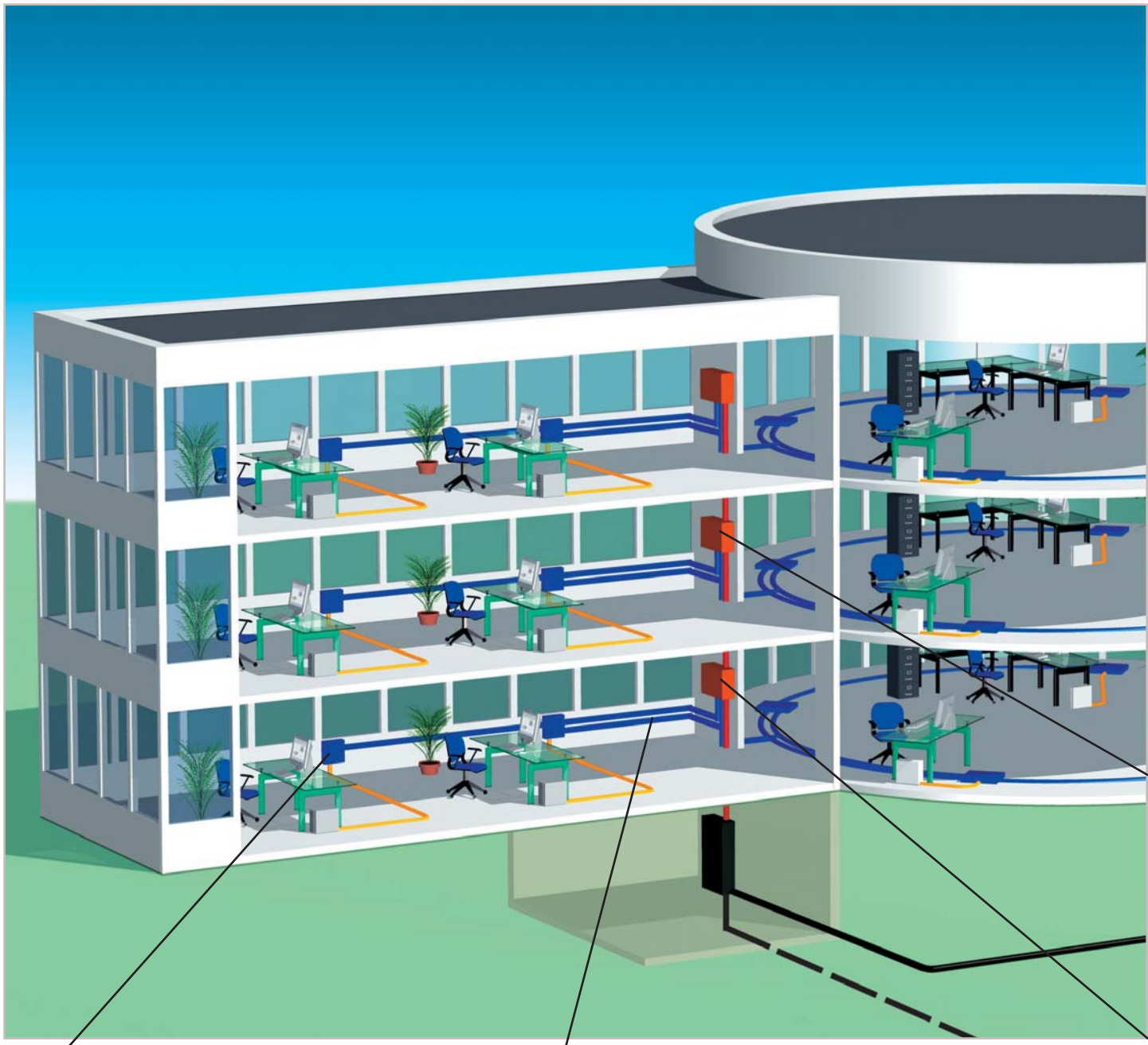
The requirements of future-proof and flexible structured cabling are largely determined by three fundamental cabling standards addressing specific geographic regions:

Standard	Description
Europe	EN 50173-1 (2003) Cabling Standard Information Technology Generic Cabling Systems
North America	TIA/EIA 568 B. 1 (2001) / B.2-10 (2008) Commercial Building Telecommunications Cabling Standard
World	ISO/IEC 11801 Edition 2002 / ISO/IEC 11801 Amd 1:2008 Cabling Standard, Generic Cabling for Customer Premises

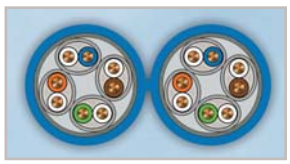
The TIA/EIA is not a standard as such, but an industry specification in the North American market. It also contains requirements regarding the transmission characteristics of cabling and components that differ from those of the EN or ISO/IEC. It has its origins in the specification of unshielded copper components.



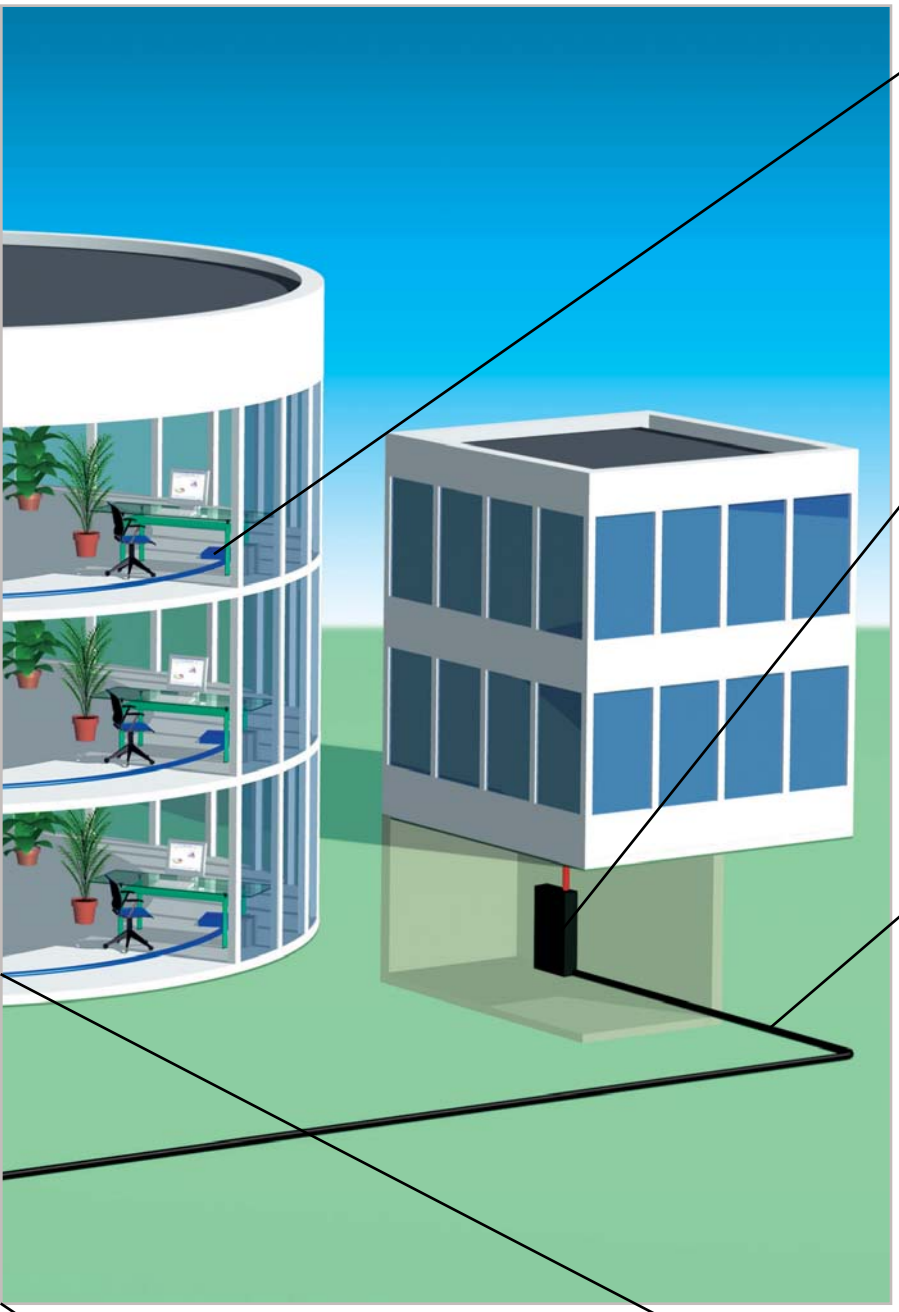
LANscape® - Structured Cabling according to ISO/IEC 11801 (2002) and EN 50173-1 (2003)



Horizontal Subsystem:
FutureCom™ Outlets and Accessories

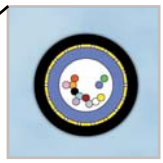


Horizontal Subsystem:
FutureCom Data Cables S/FTP, F/FTP, SF/UTP or F/UTP



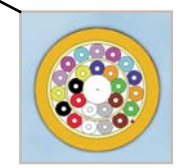

Horizontal Subsystem:
FutureCom Floor Distributors


Campus Backbone – Building Distributor:
19" Patch Panels
(Fibre products see LANscape® Fibre Optic Catalog)




Campus Backbone – Backbone Cabling:
Fibre Optic Cables
(see LANscape Fibre Optic Catalog)


Building Backbone – Horizontal Distributor:
FutureCom 19" Distribution Panels
or 19" Fibre Patch Panels
(Fibre products see or the LANscape Fibre Optic Catalog)



Building Backbone – Vertical Area Cabling:
Fibre Optic Cable or FutureCom S/FTP, F/FTP, SF/UTP, F/UTP
(Fibre products see LANscape Fibre Optic Catalog)

LANscape® - Structured Cabling according to ISO/IEC 11801 (2002) and EN 50173-1 (2003)

In EN 50173-1 and also ISO/IEC 11801 structured premises cabling is separated into three areas: Campus Backbone, Building Backbone and Horizontal Subsystem.
Building cabling can utilise cabling with both symmetrical copper cables and components and fibre optic cables and components. In the primary area, only FO cables and components are used.

Campus Backbone

Campus cabling (backbone) links the individual buildings in one location with one another. The campus distributor forms the centre of primary cabling. Due to the relatively long transmission paths, only fibre optic cabling is worth considering. Corning offers a fibre optic modular cabling solution which can be combined with copper-component cabling systems.
For the campus environment, mainly single-mode fibre cable is used, which distinguishes itself by its low attenuation and high bandwidth. A further argument for fibre optic cable in this area is its electromagnetic insensitivity.

Building Backbone

The connection between the building distributor and the various horizontal distributors is designated as the secondary area. It represents the backbone of the building. The cabling of the vertical area can be carried out with both symmetrical copper cables and fibre optic cables. “Highend” copper data cable (bandwidths up to 1500 MHz), such as those you can find in the Corning FutureCom™ product range, can also be used in the secondary area for lengths up to 100 m.

For increased bandwidth requirements, fibre optic cables (generally multi-mode fibre cables) are recommended in this area for greater future security.

Horizontal Subsystem

In the horizontal subsystem, mainly copper cable is used. The cabling is installed in a star shape radiating out from the horizontal distributor to the individual connection boxes. The distance, however, should not exceed 90 m, since the cabling would then no longer comply with the standard.
An additional option in the horizontal area is “fibre to the desk” (FTTD), i.e. fibre optic cabling to the workstation. This is used for high bandwidth or long distance centralised cabling applications.

2 FutureCom™ F

2.1. System Overview 14

2.2. Certificates 17

2.3. Cables

2.3.1. S/FTP 1500/22 18

2.3.2. S/FTP 1200/22 20

2.3.3. S/FTP 1000/22 22

2.3.4. S/FTP 1000/22s 24

2.4. Hardware

2.4.1. S1200 Module Technology 26

2.4.2. S1200 Module and Accessories 27

2.4.3. S1200 Connector Types 28

2.4.4. Tools and Accessories 30

2.4.5. Outlets and Accessories 31

2.4.6. Floor box solutions 34

2.4.7. Patch Panels and Accessories 36

2.4.8. Consolidation Point Housing for S1200 Module 38

2.5. Patch Cords

2.5.1. Cat. 7 Patch Cords 39

2.5.2. Cat. 6 Patch Cords 41

2.5.3. Cat. 5 Patch Cords 42

2.5.4. U/UTP flex Patch Cords 45

2.5.5. TV Connecting Cable 50

2.6. Plug & Play™ Solutions

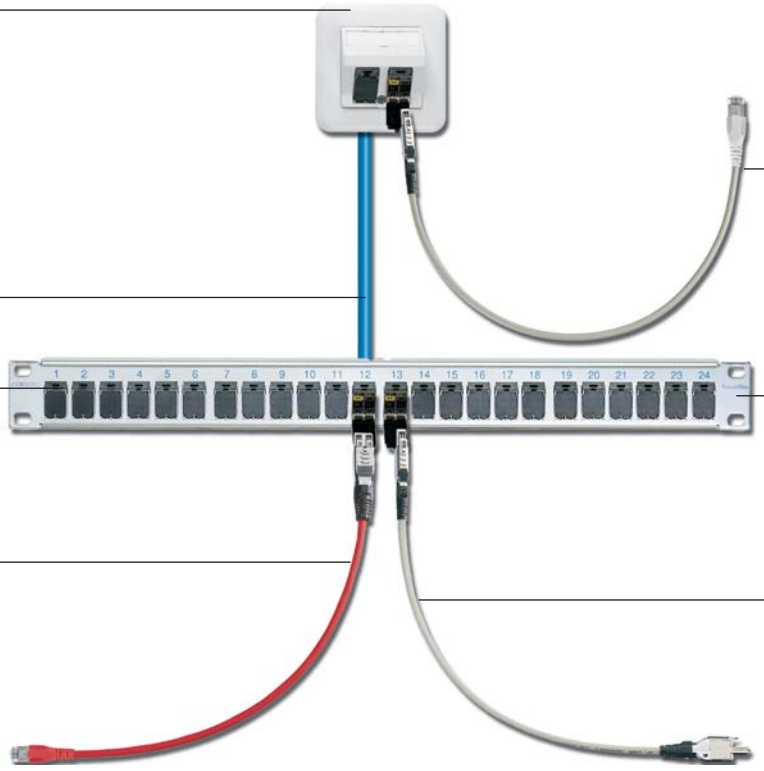
2.6.1. S1200 Solution Package, 1x S/FTP1200/22, 2S 51

2.6.2. S1200 Consolidation Point Cable 52

FutureCom™ F

System Overview

FutureCom™ F is Cornings' high-end system solution for symmetrical copper cabling. It satisfies all the requirements of the current ISO/IEC 11801 (2002) / ISO/IEC 11801 Amd 1:2008 and EN 50173-1 (2003) standards for class F/F_A links and Category 7_A for the components. The FutureCom F system is part of the Pretium™ Solutions family. Pretium™ Solutions is Corning Cable Systems' high performance solution set for fibre and copper premises networks.



Face Plate
"DELTAprofil",
80 x 80 mm
WAXWSE-00000-C001
and **S1200 Frame Set**,
for 2 S1200 modules,
Cat. 7, inclined
CAXFSE-S0201-C001

FutureCom
S/FTP 1200/22
CCXFCB-L0047-C001-L7

S1200 Module,
Cat. 7, shielded,
CAXFSM-00100-C001

S/FTP flex/26
Patch Cord,
red, S1200/4 and
RJ45 connector, 4 pairs,
for up to 10GBASE-T
CCAFCB-G5021-A020-C0

SF/UTP flex/26
Patch Cord,
grey, S1200/2 and
RJ45 connector, 2 pairs,
for 10/100Base-T
CCAFCB-G1024-A030-C1

S1200 Patch Panel 19",
for up to 24 S1200
Modules,
1 U, high-grade steel
CAXFSV-02400-C002

SF/UTP flex/26
Patch Cord,
grey, 2x S1200/2
connectors,
2 pairs, Cat. 7
CCAFCB-G1026-A020-C1

The highest level of system performance up to 10GBase-T for the complete link is achieved through the utilisation of high-quality Category 7_A cables, connectors and patch cords. The resulting performance and future security guarantee the maximum level of investment protection for cabling.

FutureCom F cabling conforms with the standards and is outstandingly well suited for all recognised standardised voice and data transmission procedures. This applies to analogue voice transmission, ISDN, Token Ring, Ethernet (10-Base-T), Fast Ethernet (100Base-TX), 100 Base- VG, ATM 155Mbit/s, Gigabit Ethernet (1000Base-T) and 10 Gigabit Ethernet (10GBase-T).

The FutureCom F system offers technical transmission possibilities similar to those of optical cabling systems and permits multimedia applications, such as TV transmission. In addition, it enables the optimal utilisation of cabling through the use of 2-pair patch cords (cable sharing).

The performance of the FutureCom F cabling system has been certified by an independent testing body (see certificate). Of course, all EMC values standardised in Europe are observed.

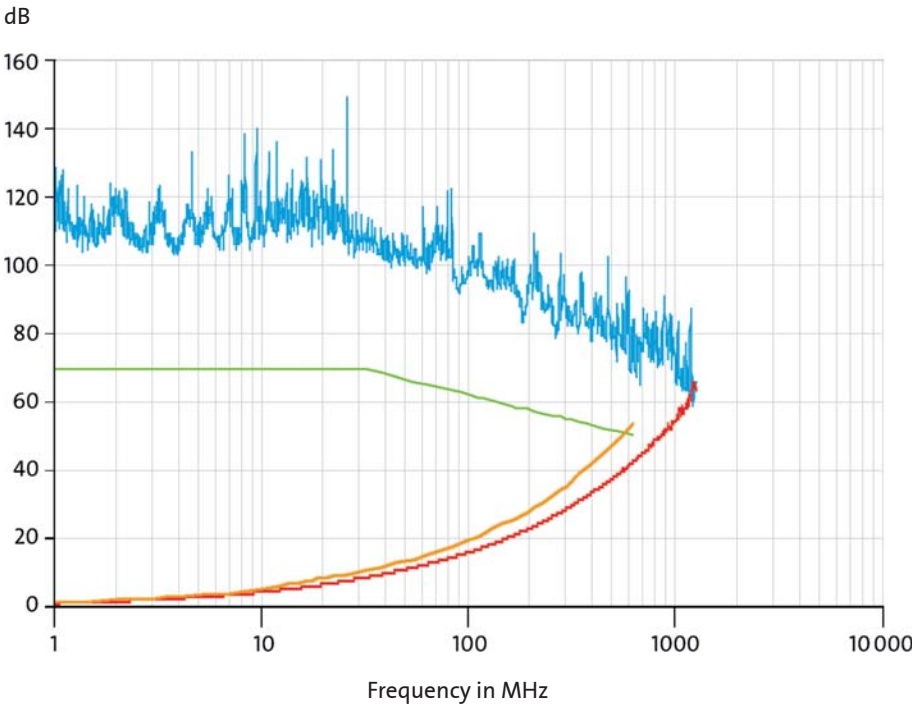
System Data for Channel Class F

Electrical characteristics (at 20°C)

Frequency [MHz]	1	10	20	62.5	100	155.5	250	600	850	1000	1200
Max. attenuation according to standard [dB]*	4	-	-	-	20.8	-	33.8	54.6	-	-	-
Typical attenuation [dB]	**1.9**	**5.3**	**7.5**	**13.4**	**17.1**	**21.4**	**27.5**	**43.5**	**52.3**	**57.6**	**69.2**
Min. NEXT values according to standard [dB]*	65	-	-	-	62.9	-	56.9	51.2	-	-	-
Typical NEXT values [dB]	**104**	**99**	**96**	**89**	**86**	**82**	**78**	**68**	**60**	**58**	**53**
Min. ACR values according to standard [dB]*	61	-	-	-	42.1	-	23.1	-3.4	-	-	-
Typical ACR values [dB]	**102.1**	**93.7**	**88.5**	**75.6**	**68.9**	**60.6**	**50.5**	**24.5**	**7.7**	**0.4**	**-**
Min. ELFEXT values according to standard [dB]*	65	-	-	-	44.4	-	37.8	31.3	-	-	-
Typical ELFEXT values [dB]	**103**	**95**	**91**	**83**	**79**	**74**	**68**	**54**	**45**	**41**	**30**
Min. return loss according to standard [dB]*	19	-	-	-	12	-	8	8	-	-	-
Typical return loss [dB]	**21**	**21**	**21**	**21**	**21**	**21**	**19**	**16**	**15**	**14**	**10**

* According to ISO/IEC 11801 Amd 1:2008

The system values cited only apply to the use of original FutureCom F products. Derived values, such as PSACR, PSNEXT, PSELFEXT, also comply with the standard values, but are not shown.

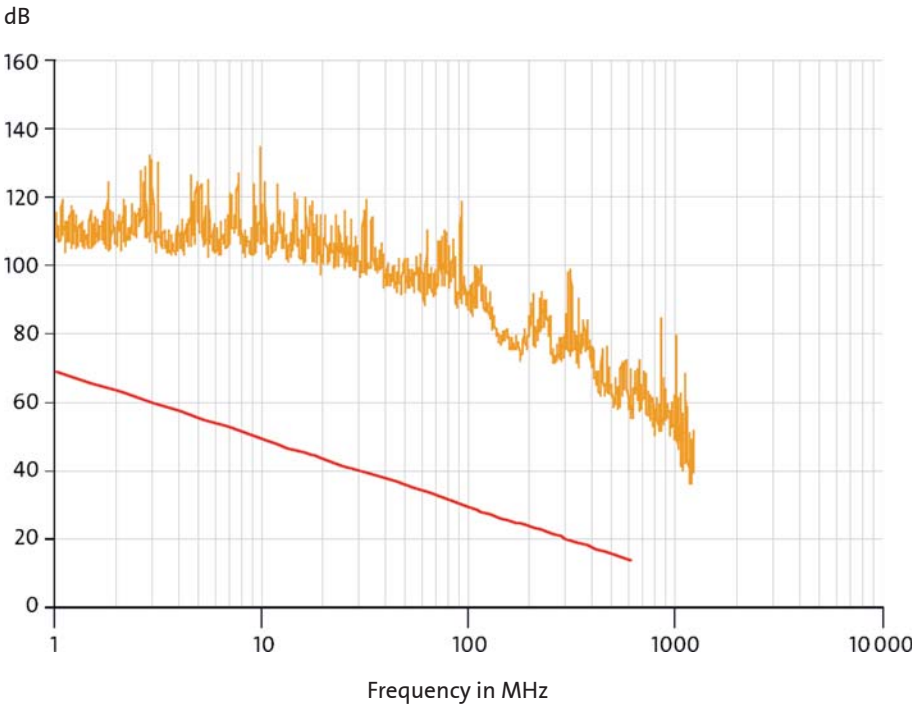


Attenuation and Near-end Crosstalk (NEXT)

- Typical NEXT values [dB]
- Min. NEXT values according to standard [dB]
- Max. attenuation according to standard [dB]
- Typical attenuation [dB]

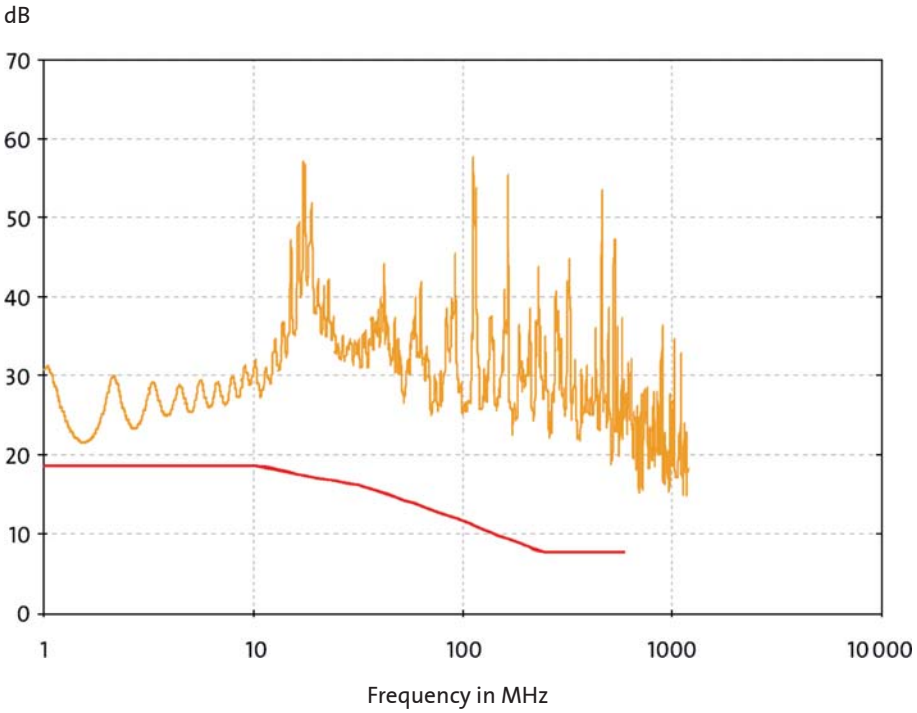
FutureCom™ F

System Data for Channel Class F



Far-end Crosstalk relating to the Far End (ELFEXT)

- Typical ELFEXT values [dB]
- Min. ELFEXT values according to standard [dB]



Return Loss

- Typical return loss [dB]
- Min. return loss according to standard [dB]

Test Setup

- FutureCom™ F test cord S/FTP flex/26, 2 m
- S1200 Module
- 90 m FutureCom S/FTP 1200/22 cable
- S1200 Patch Panel 19“
- FutureCom F test cord S/FTP flex/26, 2 m

Nominal intrinsic impedance	100 Ω
Max. DC loop resistance (according to standard)	40 Ω
DC loop resistance (typ. system values)	15 Ω
Max. delay skew (according to standard)	0.05 µs
Delay skew (typ. system values)	<0.02 µs

Certificates

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom F (3-Connector-PL)**

Data Cable 50m:	Corning FutureCom S-STP 600/23 Cat.7
CP Cable 40m:	Corning FutureCom S-STP 600/23 Cat.7
Patch Panel:	Corning FutureCom F S1200 Modul, shielded, Cat.7
Wall Outlet:	Corning FutureCom F S1200 Modul, shielded, Cat.7
CP:	Corning FutureCom F S1200 Modul, S1200-Plug, shielded, Cat.7

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

Results: Up to a bandwidth of **Class F**, the specimen, a **3-Connector-Permanent Link**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1185a-03-E, from 12 November 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 12 November 2003

Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom F (4-Connector-Channel)**

Data Cable: 50m and 40m	Corning FutureCom S-STP 600/23, Cat.7
Patch Cable: 3x 2m	Corning FutureCom S-STP flex/26
Patch Panel:	Corning FutureCom F S1200 Modul, shielded, Cat.7
Wall Outlet:	Corning FutureCom F S1200 Modul, shielded, Cat.7
CP:	Corning FutureCom F S1200 Modul, shielded, Cat.7

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

Results: Up to a bandwidth of **Class F**, the specimen, a **4-Connector-Channel**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1186a-03-E, from 12 November 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 12 November 2003

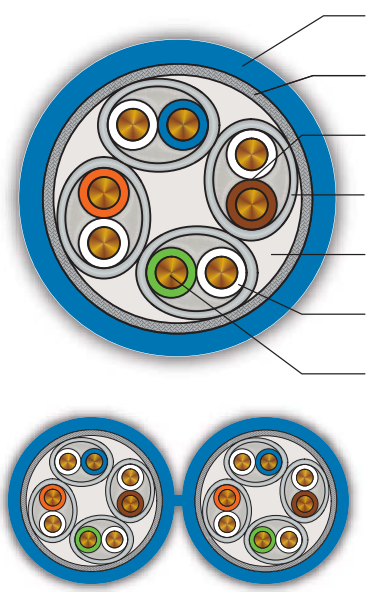
Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

FutureCom™ F

S/FTP 1500/22, Cat. 8 Cables



Application

The FutureCom™ S/FTP 1500/22 cable is designed for applications up to 1500 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-7.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1500/22 cable specified up to 1500 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<2 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**31.25**	**62.5**	**100**	**300**	**600**	**1000**	**1200**	**1500**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	10.1	14.5	18.5	33.3	48.9	-	-	-
Typical attenuation [dB/100 m]	**1.7**	**5.3**	**6.8**	**9.7**	**13.8**	**17.5**	**30.8**	**44**	**57.8**	**63.6**	**72**
NEXT according to standard [dB/100 m]*	80	80	80	80	75.1	72.4	65.3	60.8	-	-	-
Typical NEXT values [dB/100 m]	**>105**	**>105**	**>105**	**>105**	**>105**	**>105**	**103**	**95**	**85**	**80**	**75**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	72.5	69.4	62.3	57.8	-	-	-
Typical PSNEXT values [dB/100 m]	**102**	**102**	**102**	**102**	**102**	**102**	**100**	**92**	**83**	**77**	**72**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	64.1	58.1	54.0	44.5	38.4	-	-	-
Typical ELFEXT values [dB/100 m]	**96**	**96**	**96**	**93**	**88**	**82**	**68**	**55**	**37**	**31**	**24**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	61.1	55.1	51	41.5	35.4	-	-	-
Typical PSELFEXT values [dB/100 m]	**93**	**93**	**93**	**90**	**85**	**79**	**65**	**52**	**34**	**28**	**21**
ACR according to standard [dB/100 m]*	78	74.3	72.8	69.5	60.6	53.9	32	11.9	-	-	-
Typical ACR values [dB/100 m]	**103.3**	**99.7**	**98.2**	**95.3**	**91.2**	**87.5**	**72.2**	**51**	**27.2**	**16.4**	**3**

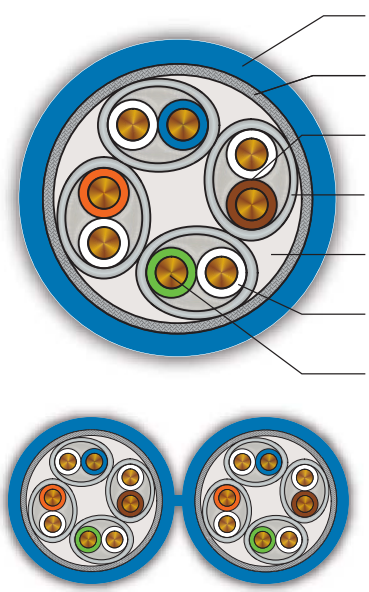
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 1500/22 4P	8	4	0.66	Yes	blue	179	7.7	66	1000	**CCXFCB-M0047-C001-L7**
S/FTP 1500/22 8P	8	8	1.34	Yes	blue	358	7.7 x 16.0	133	500	**CCXFCB-M0087-C001-L6**

FutureCom™ F

S/FTP 1200/22, Cat. 8 Cables



Application

The FutureCom™ S/FTP 1200/22 cable is designed for applications up to 1200 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-7.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1200/22 cable specified up to 1200 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<2 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**1000**	**1200**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.6**	**4.9**	**6.4**	**7**	**9**	**12.8**	**16.5**	**28.9**	**41.7**	**54.4**	**59.8**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>105**	**>105**	**>105**	**>105**	**>105**	**>105**	**>105**	**102**	**95**	**85**	**80**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**103**	**103**	**103**	**103**	**103**	**103**	**103**	**100**	**93**	**83**	**78**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**96**	**96**	**96**	**96**	**93**	**88**	**82**	**70**	**55**	**40**	**35**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**94**	**94**	**94**	**94**	**91**	**86**	**80**	**68**	**53**	**38**	**33**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**103.4**	**100.1**	**98.6**	**98**	**96**	**92.2**	**88.5**	**73.1**	**53.3**	**30.5**	**20.2**

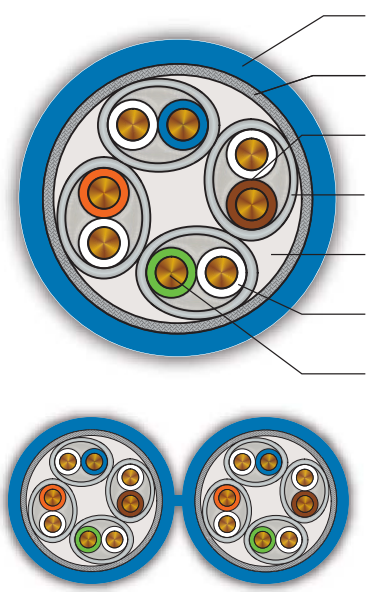
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 1200/22 4P	8	4	0.66	Yes	blue	179	7.7	66	1000	**CCXFCB-L0047-C001-L7**
S/FTP 1200/22 8P	8	8	1.34	Yes	blue	358	7.7 x 16.0	133	500	**CCXFCB-L0087-C001-L6**

FutureCom™ F

S/FTP 1000/22, Cat. 7_A Cables



Application

The FutureCom™ S/FTP 1000/22 cable is designed for applications up to 1000 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1000/22 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<2 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.6**	**4.9**	**6.4**	**7**	**9**	**12.8**	**16.5**	**28.9**	**41.9**	**47.7**	**54.9**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**97**	**93**	**88**	**84**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**95**	**91**	**86**	**82**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**96**	**96**	**96**	**96**	**93**	**88**	**82**	**70**	**55**	**45**	**40**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**94**	**94**	**94**	**94**	**91**	**86**	**80**	**68**	**53**	**43**	**38**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.4**	**95.1**	**93.6**	**93**	**91**	**87.2**	**83.5**	**68.1**	**51.1**	**40.3**	**29.1**

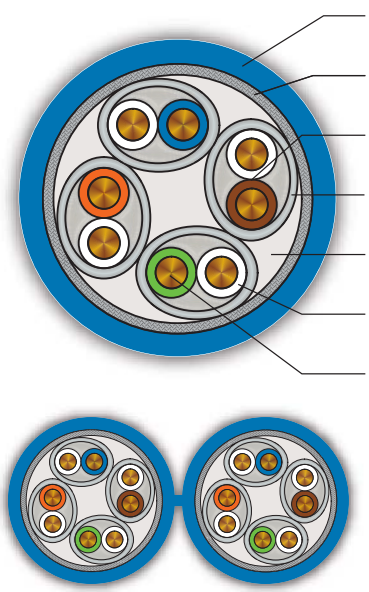
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 1000/22 4P	7_A	4	0.63	Yes	blue	167	7.5	62	1000	**CCXFCB-I0047-C001-L7**
S/FTP 1000/22 8P	7_A	8	1.29	Yes	blue	334	7.5 x 16.0	125	500	**CCXFCB-I0087-C001-L6**

FutureCom™ F

S/FTP 1000/22s, Cat. 7_A Cables



Application

The FutureCom™ S/FTP 1000/22s cable is designed for applications up to 1000 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1000/22s cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.8**	**5.1**	**6.6**	**7.2**	**9.3**	**13.2**	**17**	**29.4**	**43**	**48.4**	**55.6**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**96**	**93**	**88**	**83**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**94**	**90**	**85**	**81**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**95**	**95**	**95**	**95**	**92**	**87**	**81**	**69**	**54**	**44**	**39**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**85**	**79**	**67**	**52**	**42**	**37**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.2**	**94.9**	**93.6**	**92.8**	**90.7**	**86.8**	**83**	**66.6**	**50**	**39.6**	**27.4**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 1000/22S 4P	7_A	4	0.56	Yes	blue	142	7.3	52	1000	**CCXFCR-I0047-C001-L7**
S/FTP 1000/22S 8P	7_A	8	1.15	Yes	blue	284	7.3 x 15.5	105	500	**CCXFCR-I0087-C001-L6**

FutureCom™ F

S1200 Module Technology

S1200 Module

- Category 7_A module for channels according to class F_A
- Up to 1200 MHz bandwidth per pair
- Dust protection flap to prevent exposure to contaminants
- Wide range of installation options
- Few individual components
- High-level component density
- Individual shielding of the modules

Individual components of the S1200 Module

S1200 Module Adapter

Removing the module icon (the black plastic clasp on the upper side of the S1200 module) enables the S1200 module to be inserted into the module adapter. The S1200 adapter extends the application possibilities of the Cat. 7_A module to many components in the LANscape® product range, such as:

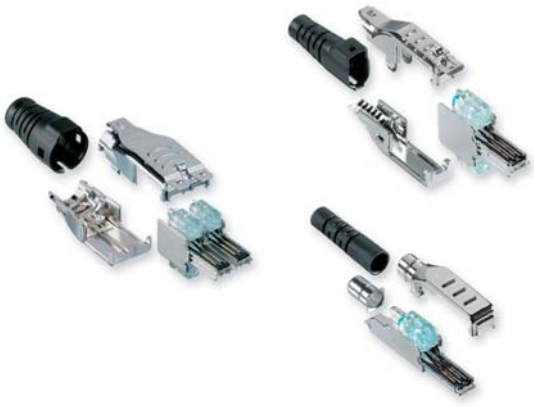
- Patch panels
- Frame sets
- Floor box solutions

S1200 Module with adapter for LANscape interface

S1200 Connector Types

For the FutureCom™ F system, the following connector types are offered. All patch cord modes can be created using these connectors.

- S1200/4 shielded connector, 4-pair (for solid or stranded conductors)
- S1200/2 shielded connector, 2-pair
- S1200/1 shielded connector, 1-pair



S1200 Connector Types

FutureCom™ F

S1200 Module and Accessories

S1200 Module

- Bandwidths up to 1200 MHz per pair of wires
- Quick and easy to install
- IDC connection (IDC = Insulation Displacement Contacts)
- Universal usage (direct or with adapter) in many LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules

Description	Units per Delivery	Order Number
S1200 Module, 1x S1200, shielded, Cat.7_A, for installation in LANscape and FutureCom™ S1200 patch panels, outlets and floor box solutions		
silver	1/1	CAXFSM-00100-C001

S1200 Module Adapter

Description	Units per Delivery	Order Number
S1200 Module Adapter, for installation of S1200 modules in LANscape patch panels, outlets and floor box solutions		
silver	6/1	CAXFSN-00110-C001

Blank Covers

Description	Units per Delivery	Order Number
Blank cover for installation in FutureCom F S1200 patch panels, outlets and floor box solutions (S1200 direct assembly without module adapters)		
white, RAL 9010	10/1	CAXFSN-00101-C001
black, RAL 9005	10/1	CAXFSN-00108-C001

FutureCom™ F

S1200 Connector Types

Features

- Bandwidths up to 1200 MHz per pair of wires
- Quick and easy to install
- IDC connection (IDC = Insulation Displacement Contacts)
- High density, i.e. for each module the following connector combinations can be used:
  - one 4-pair connector
  - two 2-pair connectors
  - one 2-pair connector and two 1-pair connectors
  - four 1-pair connectors
- Shielded S1200 connectors are designed for use with S/FTP cables

S1200/4 Connector, 4-pairs, shielded, Cat.7_A

Description	Units per Delivery	Order Number
S1200/4 connector, shielded, Cat. 7_A, 4-pair, for flex wire cables AWG 26		
silver	1/1	CAXFSS-00100-C001

Description	Units per Delivery	Order Number
S1200/4 connector, shielded, Cat. 7_A, 4-pair, for solid wire cables AWG 22 to 23, e.g. for consolidation point cabling		
silver	1/1	CAXFSS-00100-C004

S1200 Connector Types

S1200/2 Connector, 2-pairs, shielded, Cat.7$_A$

Description	Units per Delivery	Order Number
S1200/2 connector, shielded, Cat. 7$_A$, 2-pair, for flex wire cables AWG 26		
silver	1/1	CAXFSS-00100-C002

S1200/1 Connector, 1-pair, shielded, Cat.7$_A$

Description	Units per Delivery	Order Number
S1200/1 Connector, shielded, Cat. 7$_A$, 1-pair, for flex wire cables AWG 26		
silver	1/1	CAXFSS-00100-C003

FutureCom™ F

Tools and Accessories

S1200 Assembly Tool

- Integrated knife for the removal of the jacket
- Stripping option for PiMF foils with a defined length
- Management for arrangement or shaping of the individual pairs (PiMF)
- Defined section length of wires

Description	Units per Delivery	Order Number
S1200 assembly tool, for installation of S1200 modules and S1200/4 or S1200/2 connectors		
yellow	1/1	CAXFSN-00000-C001

Comfort Parallel Pliers

Description	Units per Delivery	Order Number
Comfort Parallel Pliers for termination of IDC contacts on FutureCom™ S1200 modules		
metal	1/1	CAXCSN-00000-C008

Copper Conducting Tape 9 x 45 mm

Description	Units per Delivery	Order Number
Copper conducting tape 9 x 45 mm on roll, for FutureCom modules		
9 x 45 mm	1000/1	CAXCSN-00000-C011

Outlets and Accessories

S1200 Frame set

- Direct assembly of S1200 modules
- Central plate dimensions of 50 x 50 mm. Can be combined with “DELTAprofil“ and “DELTAfläche“ face plates, as well as face plates from other manufacturers
- Designation window

Description	Units per Delivery	Order Number
S1200 Frame Set, inclined, for 2 FutureCom™ S1200 modules, including mounting frame and 50 x 50 mm central plate with designation window, threaded		
white, RAL 9010	1/1	CAXFSE-S0201-C001

Frame set, inclined, projecting, 2P

- Installation of S1200 modules with module adapter
- Central plate dimensions of 50 x 50 mm. Can be combined with “DELTAprofil“ and “DELTAfläche“ face plates, as well as face plates from other manufacturers
- Designation window

Description	Units per Delivery	Order Number
Frame set, inclined, projecting for 2 S1200 modules with module adapter, including mounting frame and 50 x 50 mm central plate with designation window and dust protection flaps		
white, RAL 9010	1/1	WAXWSE-V0201-C001
pearl white, RAL 1013	1/1	WAXWSE-V0202-C001

FutureCom™ F

Outlets and Accessories

Universal Housing, inclined, projecting, 2P

- Direct assembly of S1200 modules
- Surface mount housing suitable for 87 x 87 mm and 147 x 87 mm face plates (see page 192)

Description	Units per Delivery	Order Number
Universal housing, inclined, projecting, for direct integration of two S1200 modules in 147 x 87 mm and 87 x 87 mm face plates, central partition provided		
white, RAL 9010	1/1	WAXWSE-V0201-C002

Face plate, 87 x 87 mm

Description	Units per Delivery	Order Number
Face Plate, 87 x 87 mm, for one housing, including screws for frame assembly in installation outlets (Suitable surface mount housing: WAXWSE-00001-C004)		
white, RAL 9010	1/1	WAXWSE-00001-C005

Face plate, 147 x 87 mm

Description	Units per Delivery	Order Number
Face Plate, 147 x 87 mm, for two housings, including screws for frame assembly in installation outlets (Suitable surface mount housing : WAXWSE-00001-C006)		
white, RAL 9010	1/1	WAXWSE-00001-C007

Outlets and Accessories

Frame set, inclined, projecting, 3P

Description	Units per Delivery	Order Number
Frame set, inclined, projecting for 3 S1200 modules with module adapter, including mounting frame and triple housing with designation window and dust protection flaps, also as 80 x 80 mm face plate		
white, RAL 9010	1/1	WAXWSE-V0301-C001
pearl white, RAL 1013	1/1	WAXWSE-V0302-C001

Frame set, inclined, projecting, 6P

Description	Units per Delivery	Order Number
Frame set, inclined, projecting for 6 S1200 modules with module adapter, including mounting frame and two triple housings with designation window and dust protection flaps, also as 151 x 80 mm face plate		
white, RAL 9010	1/1	WAXWSE-V0601-C001
pearl white, RAL 1013	1/1	WAXWSE-V0602-C001

Installation variant

Bill of materials

- Frame set, inclined, projecting, w, 6P (LANscape®)
  1 x WAXWSE-V0601-C001
- S1200 Module
  4 x CAXFSM-00100-C001
- S1200 Module Adapter
  4 x CAXFSN-00110-C001
- S/FTPfx,bu,S1200-RJ45,4P,3m
  1 x CCAFGB-G2021-A030-C0
- S/FTPfx,bk,S1200-RJ45,2P,3m
  1 x CCAFGD-G6024-A020-C1

FutureCom™ F

Floor box solutions

Features

- Specially designed for direct integration of S1200 modules
- Robust metal construction, black
- No additional mounting insert required
- Integrated individual strain relief for each cable (regardless of the diameter)
- Strain relief mountable in various positions
- No screwing required
- Integrated grounding bolt and tab
- Designation window
- Upgradeable with protection box for fibre optic cabling
- Upgradeable with special splice trays

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GES 2, GES 4, GES 4/10, GESR 4, GES 6, GES 6/10, GESR 7/10 (outer) or GES 8/10, for the installation of 6 FutureCom™ F S1200 modules, with integrated cable strain relief and six cable ties, designation window, metal construction		
black, RAL 9005	1/1	CAXFSU-00600-C013

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GESR 7/10 (centre), GES 9 or GESR 9, for the installation of 9 FutureCom F S1200 modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	CAXFSU-00900-C013

Floor box solutions

Mounting Panels for VanGeel Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for VanGeel Floor Box IK-1 (long), for the installation of 9 FutureCom™ F S1200 modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	**1/1**	**CAXFSU-00900-C015**

Mounting Panels for Kleinhuis Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Kleinhuis Floor Box GR. II and GR. III (outside only), for the installation of 9 FutureCom F S1200 modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	**1/1**	**CAXFSU-00900-C012**

Installation variant

Bill of materials

- Mounting panel Kleinhuis Gr.II/III (3x3 S1200), bk
  1 x CAXFSU-00900-C012
- S1200 Module
  7 x CAXFSM-00100-C001
- Blank Covers, white
  1 x CAXFSN-00101-C001
- Blank Covers, black
  1 x CAXFSN-00108-C001
- SF/UTPfx,gy,S1200-RJ45,2P,3m
  2 x CCAFGD-D1024-A030-C1
- S/FTPfx,bu,S1200-RJ45,4P,3m
  1 x CCAFGB-G2021-A030-C0

FutureCom™ F

Patch Panels and Accessories

Features

- Specially designed for direct integration of S1200 modules
- Integrated shielded transitional spring for optimised shielding
- For Patch Panel accessories see page 209

S1200 Patch Panel 19“, incl. 24 S1200 modules

Description	Units per Delivery	Order Number
S1200 Patch Panel 19“, shielded, Cat. 7_A, including 24 FutureCom™ F S1200 modules, with integrated cable strain relief and shielded transitional spring, 1 U		
high-grade steel	1/1	CAXFSV-02400-C001

S1200 Patch Panel 19“

Description	Units per Delivery	Order Number
S1200 Patch Panel 19“, for up to 24 FutureCom F S1200 modules, with integrated cable strain relief and shielded transitional spring, 1 U		
high-grade steel	1/1	CAXFSV-02400-C002

Patch Panels and Accessories

Features

- Specially designed for direct integration of S1200 modules
- Integrated shielded transitional spring for optimised shielding
- For Patch Panel accessories see page 209

S1200 Patch Panel 10“

Description	Units per Delivery	Order Number
S1200 Patch Panel 10“, for up to 12 FutureCom™ F S1200 modules, with integrated cable strain relief and shielded transitional spring, 1 U		
high-grade steel	1/1	CAXFSV-01200-C001

FutureCom™ F

Consolidation Point Housing for S1200 Module

Application

The FutureCom™ F 10“ Consolidation Point Housing is universally applicable for ceiling, wall, false floor or desk mounting. This concept permits a free user-specific configuration of building, floor and office distributors.

Features

- Full metal housing for the installation of up to 12 FutureCom S1200 modules
- Standard-compatible according to ISO/IEC 11801 (2002) and EN 50173-1 (2003)
- Easy installation for a distribution or consolidation point
- Consolidation Point Housing is suitable for ceiling, wall, false floor or desk assembly
- Individual strain relief for the incoming and outgoing cable sections via cable ties
- Dust-proof feedthrough for incoming cable
- Easy plug-in of consolidation point cable (dust protection and mechanical protection)
- Housing base electrically conductive for optimal shielding transition or grounding
- Installation height of 60 mm
- Housing is fastened using special non-detachable screws
- Black sheet steel housing top, RAL 9005

Description	Units per Delivery	Order Number
Consolidation Point Housing for max. 12 FutureCom F S1200 modules, with strain relief for incoming data cables, patch cord strain relief and dust protection flap for floor, wall and ceiling installation, 60 x 263 x 320 mm (HxWxD)		
black, RAL 9005	1/1	WAXWSW-00008-C014

FutureCom™ F

Cat. 7 Patch Cords, 2x S1200/2

Description

The FutureCom™ F Category 7_A patch cords have two individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with two shielded S1200/2 connectors.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths.

Features

- S/FTP flex cable, Category 7
- S1200/2 connector fully configured at each end
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class F (2002) link specification
- Category 7_A
- Outstanding transmission characteristics according to 10GBase-T

S/FTP flex/26 Patch Cords, 2 Pairs, Cat. 7_A

Length	grey
1 m	CCAFGB-G1026-A010-C1
2 m	CCAFGB-G1026-A020-C1
3 m	CCAFGB-G1026-A030-C1
5 m	CCAFGB-G1026-A050-C1
10 m	CCAFGB-G1026-A100-C1

Other lengths upon request

FutureCom™ F

Cat. 7 Patch Cords, 2x S1200/4

Description

The FutureCom™ F Category 7_A patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with two shielded S1200/4 connectors.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths.

Features

- S/FTP flex cable, Category 7
- S1200/4 connector fully configured and application-neutral
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class F (2002) link specification
- Category 7_A
- Outstanding transmission characteristics according to 10GBase-T

S/FTP flex/26 Patch Cords, 4 Pairs, Cat. 7_A

Length	grey
1 m	CCAFGB-G1022-A010-C0
2 m	CCAFGB-G1022-A020-C0
3 m	CCAFGB-G1022-A030-C0
5 m	CCAFGB-G1022-A050-C0
10 m	CCAFGB-G1022-A100-C0

Other lengths upon request

FutureCom™ F

Cat. 6 Patch Cords, S1200/4 - RJ45

Description

The application-neutral FutureCom™ F Category 6 patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded S1200/4 connector and one RJ45 connector. The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- S/FTP flex cable, Category 7
- Application-neutral due to using all four pairs of S1200/4 and RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class E (2002) link specification
- Category 6 (2002)
- Outstanding transmission characteristics according to 10GBase-T

Ordering Information

Length	grey	blue	yellow	green	red	black
0.5 m	CCAFGB-G1021-A005-C0	on request	on request	on request	on request	on request
1 m	CCAFGB-G1021-A010-C0	CCAFGB-G2021-A010-C0	CCAFGB-G3021-A010-C0	CCAFGB-G4021-A010-C0	CCAFGB-G5021-A010-C0	CCAFGB-G6021-A010-C0
2 m	CCAFGB-G1021-A020-C0	CCAFGB-G2021-A020-C0	CCAFGB-G3021-A020-C0	CCAFGB-G4021-A020-C0	CCAFGB-G5021-A020-C0	CCAFGB-G6021-A020-C0
3 m	CCAFGB-G1021-A030-C0	CCAFGB-G2021-A030-C0	CCAFGB-G3021-A030-C0	CCAFGB-G4021-A030-C0	CCAFGB-G5021-A030-C0	CCAFGB-G6021-A030-C0
5 m	CCAFGB-G1021-A050-C0	CCAFGB-G2021-A050-C0	CCAFGB-G3021-A050-C0	CCAFGB-G4021-A050-C0	CCAFGB-G5021-A050-C0	CCAFGB-G6021-A050-C0
10 m	CCAFGB-G1021-A100-C0	on request	on request	on request	on request	on request

Other lengths upon request

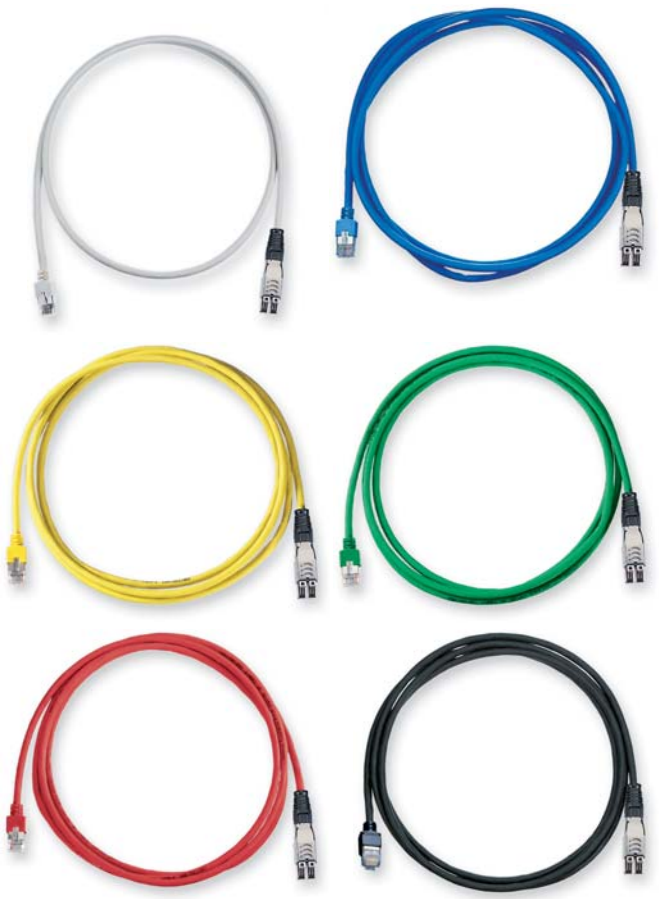
FutureCom™ F

Cat. 5 Patch Cords, S1200/4 - RJ45

Description

The application-neutral FutureCom™ F Category 5 patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded S1200/4 connector and one RJ45 connector. The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.



Features

- SF/UTP flex cable, specified up to 300 MHz
- Application-neutral due to using all four pairs of S1200/4 and RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class D (2002) link specification
- Category 5 (2002) / 5e

Ordering Information

Length	grey	blue	yellow	green	red	black
1 m	CCAFGF-D1021-A010-C0	CCAFGF-D2021-A010-C0	CCAFGF-D3021-A010-C0	CCAFGF-D4021-A010-C0	CCAFGF-D5021-A010-C0	CCAFGF-D6021-A010-C0
2 m	CCAFGF-D1021-A020-C0	CCAFGF-D2021-A020-C0	CCAFGF-D3021-A020-C0	CCAFGF-D4021-A020-C0	CCAFGF-D5021-A020-C0	CCAFGF-D6021-A020-C0
3 m	CCAFGF-D1021-A030-C0	CCAFGF-D2021-A030-C0	CCAFGF-D3021-A030-C0	CCAFGF-D4021-A030-C0	CCAFGF-D5021-A030-C0	CCAFGF-D6021-A030-C0
5 m	CCAFGF-D1021-A050-C0	CCAFGF-D2021-A050-C0	CCAFGF-D3021-A050-C0	CCAFGF-D4021-A050-C0	CCAFGF-D5021-A050-C0	CCAFGF-D6021-A050-C0
10 m	CCAFGF-D1021-A100-C0	CCAFGF-D2021-A100-C0	CCAFGF-D3021-A100-C0	CCAFGF-D4021-A100-C0	CCAFGF-D5021-A100-C0	CCAFGF-D6021-A100-C0

Other lengths upon request

FutureCom™ F

Cat. 5 Patch Cords, S1200/2 - RJ45

Description

The FutureCom™ F Category 5 patch cords are foil and braid shielded (SF/UTP). They are assembled with one S1200/2 and one RJ45 shielded connector.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- SF/UTP flex cable, specified up to 300 MHz
- Pre-terminated with one S1200/2 and one RJ45 connector, application specific
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class D (2002) link specification
- Category 5 (2002) / 5e

SF/UTP flex/26 Patch Cords, for 10/100 Base-T Applications (Pins 1.2 -3.6)

Length	grey	black
1 m	CCAFGD-D1024-A010-C1	CCAFGD-D6024-A010-C1
2 m	CCAFGD-D1024-A020-C1	CCAFGD-D6024-A020-C1
3 m	CCAFGD-D1024-A030-C1	CCAFGD-D6024-A030-C1
5 m	CCAFGD-D1024-A050-C1	CCAFGD-D6024-A050-C1
10 m	CCAFGD-D1024-A100-C1	on request

Other lengths upon request

SF/UTP flex/26 Patch Cords, for 10/100 Base-T Applications, crossed (Pins 1.2 -3.6)

Length	grey	red
1 m	CCAFGD-D1324-A010-C1	CCAFGD-D5324-A010-C1
2 m	CCAFGD-D1324-A020-C1	CCAFGD-D5324-A020-C1
3 m	CCAFGD-D1324-A030-C1	CCAFGD-D5324-A030-C1
5 m	CCAFGD-D1324-A050-C1	CCAFGD-D5324-A050-C1
10 m	CCAFGD-D1324-A100-C1	CCAFGD-D5324-A100-C1

Other lengths upon request

FutureCom™ F

Cat. 5 Patch Cords, S1200/2 - RJ45

Description

The FutureCom™ F Category 5 patch cords are foil and braid shielded (SF/UTP). They are assembled with one S1200/2 and one RJ45 shielded connector.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- SF/UTP flex cable, specified up to 300 MHz
- Pre-terminated with one S1200/2 and one RJ45 connector, application specific
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class D (2002) link specification
- Category 5 (2002) / 5e

SF/UTP flex/26 Patch Cords, for TR/ISDN & Analogue Applications (Pins 4.5 - 3.6)

Length	grey	green
1 m	CCAFGD-D1124-A010-C1	CCAFGD-D4124-A010-C1
2 m	CCAFGD-D1124-A020-C1	CCAFGD-D4124-A020-C1
3 m	CCAFGD-D1124-A030-C1	CCAFGD-D4124-A030-C1
5 m	CCAFGD-D1124-A050-C1	CCAFGD-D4124-A050-C1
10 m	CCAFGD-D1124-A100-C1	on request

Other lengths upon request

FutureCom™ F

U/UTP flex Patch Cords, S1200/2 - RJ45

Application

The FutureCom™ F U/UTP flex/26 hybrid patch cords are used for connecting existing networks or active components with an RJ45 interface. They are suitable for analogue as well as digital signal transmission.The compact and robust design of the S1200/2 connector allows in combination with an S1200 module a multifunctional usage of all connected pairs in this module (cable sharing).

Description

The FutureCom F U/UTP patch cords are assembled with one S1200/2 in compliance with IEC 61076-3-104 and one RJ45 shielded connector in compliance with IEC 60603-7. They are available in various lengths

Features

- U/UTP flex cable, specified up to 100 MHz
- Category 3
- Wire insulation: Polypropylene
- Outer jacket: Flame retardant PVC
- Operating temperature -20 °C to 60 °C

U/UTP flex/26 Patch Cords, for TR/ISDN & Analogue Applications (Pins 4.5 - 3.6)

Length	black
1 m	CCAFOC-A6124-A010-C0
2 m	CCAFOC-A6124-A020-C0
3 m	CCAFOC-A6124-A030-C0
5 m	CCAFOC-A6124-A050-C0
10 m	CCAFOC-A6124-A100-C0

Other lengths upon request

FutureCom™ F

U/UTP flex Patch Cords, S1200/2 - RJ11

Application

The FutureCom™ F U/UTP flex/26 hybrid patch cords are used for connecting existing networks or active components with an RJ11/12 interface.
They are suitable for analogue as well as digital signal transmission.The compact and robust design of the S1200/2 connector allows in combination with an S1200 module a multifunctional usage of all connected pairs in this module (cable sharing).

Description

The FutureCom F U/UTP patch cords are assembled with one S1200/2 in compliance with IEC 61076-3-104 and one RJ11 connector.
They are available in various lengths.

Features

- U/UTP flex cable, specified up to 100 MHz
- Category 3
- Wire insulation: Polypropylene
- Outer jacket: Flame retardant PVC
- Operating temperature -20 °C to 60 °C

U/UTP flex/26 Patch Cords, for TR/ISDN & Analogue Applications (Pins 4.5 - 3.6)

Length	black
1 m	CCAFOC-A6125-A010-C0
2 m	CCAFOC-A6125-A020-C0
3 m	CCAFOC-A6125-A030-C0
5 m	CCAFOC-A6125-A050-C0
10 m	CCAFOC-A6125-A100-C0

Other lengths upon request

FutureCom™ F

U/UTP flex Patch Cords, S1200/1 - RJ45

Application

The FutureCom™ F U/UTP flex/26 hybrid patch cords are used for connecting existing networks or active components with an RJ45 interface. They are suitable for analogue as well as digital signal transmission.
The compact and robust design of the S1200/1 connector allows in combination with an S1200 module a multifunctional usage of all connected pairs in this module (cable sharing).

Description

The FutureCom F U/UTP flex/26 hybrid patch cords are assembled with one S1200/1 connector according to IEC 61076-3-104 and one RJ45 connector according to IEC 60603-7.

They are available in various lengths.

Features

- U/UTP flex cable, specified up to 100 MHz
- Category 3
- Wire insulation: Polypropylene
- Outer jacket halogen-free and flame retardant (FRNC)
- Operating temperature -20 °C to 60 °C

U/UTP flex/26 Patch Cords, S1200/1 to RJ45, 1 pair

Length	black
1 m	CCAFFE-A6027-A010-C0
2 m	CCAFFE-A6027-A020-C0
3 m	CCAFFE-A6027-A030-C0
5 m	CCAFFE-A6027-A050-C0
10 m	CCAFFE-A6027-A100-C0

Other lengths upon request

FutureCom™ F

U/UTP flex Patch Cords, S1200/1 - RJ11

Application

The FutureCom™ F U/UTP flex/26 hybrid patch cords are used for connecting existing networks or active components with an RJ11/12 interface. They are suitable for analogue as well as digital signal transmission.
The compact and robust design of the S1200/1 connector allows in combination with an S1200 module a multifunctional usage of all connected pairs in this module (cable sharing).

Description

The FutureCom F U/UTP flex/26 hybrid patch cords are assembled with one S1200/1 connector according to IEC 61076-3-104 and one RJ11/12 connector according to IEC 60603-7.

They are available in various lengths.

Features

- U/UTP flex cable, specified up to 100 MHz
- Category 3
- Wire insulation: Polypropylene
- Outer jacket halogen-free and flame retardant (FRNC)
- Operating temperature -20 °C to 60 °C

U/UTP flex/26 Patch Cords, S1200/1 to RJ11, 1 pair

Length	black
1 m	CCAFFE-A6028-A010-C0
2 m	CCAFFE-A6028-A020-C0
3 m	CCAFFE-A6028-A030-C0
5 m	CCAFFE-A6028-A050-C0
10 m	CCAFFE-A6028-A100-C0

Other lengths upon request

FutureCom™ F

U/UTP flex Patch Cords, 2x S1200/1

Application

The FutureCom™ F U/UTP flex/26 patch cords are suitable for analogue as well as digital signal transmission. The compact and robust design of the S1200/1 connector allows in combination with an S1200 module a multifunctional usage of all connected pairs in this module (cable sharing).

Description

The FutureCom F U/UTP flex/26 patch cords are assembled with two S1200/1 connectors according to IEC 61076-3-104.

They are available in various lengths.

Features

- U/UTP flex cable, specified up to 100 MHz
- Category 3
- Wire insulation: Polypropylene
- Outer jacket halogen-free and flame retardant (FRNC)
- Operating temperature -20 °C to 60 °C

U/UTP flex/26 Patch Cords, 2x S1200/1 , 1 pair

Length	black
1 m	CCAFFE-A6034-A010-C0
2 m	CCAFFE-A6034-A020-C0
3 m	CCAFFE-A6034-A030-C0
5 m	CCAFFE-A6034-A050-C0
10 m	CCAFFE-A6034-A100-C0

Other lengths upon request

FutureCom™ F

TV Connecting Cable

TV/CATV Patch Cord, 1x TV Connector

- Very low surface transfer impedance (<10 mΩ/m at 10 MHz)
- S1200/1 connector and balun (connector or jack) for the conversion of Cat. 7_A cabling into coaxial cabling incl. impedance adjustment

Description	Units per Delivery	Order Number
FutureCom TV/CATV Patch Cord, 1x S1200/1 and 1x TV connector (IEC 60169-2), FRNC sheath		
green	1/1	CCAFGB-I4054-A030-C0

Other lengths upon request

Description	Units per Delivery	Order Number
FutureCom TV/CATV Patch Cord, 1x S1200/1 and 1x TV jack (IEC 60169-2), FRNC sheath		
green	1/1	CCAFGB-I4055-A030-C0

Other lengths upon request

FutureCom™ F

Plug & Play™ Solutions, S1200 - S1200

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ F Plug & Play Solution Packages are factory pre-terminated cables with S1200 modules at each end.
They are generally offered with FutureCom S/FTP 1200/22 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S1200 Solution Package, S/FTP1200/22 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with two S1200 modules			
S/FTP 1200/22-10	10 m	1/1	CCAFCB-M2042-A100-C0
S/FTP 1200/22-15	15 m	1/1	CCAFCB-M2042-A150-C0
S/FTP 1200/22-20	20 m	1/1	CCAFCB-M2042-A200-C0
S/FTP 1200/22-25	25 m	1/1	CCAFCB-M2042-A250-C0
S/FTP 1200/22-30	30 m	1/1	CCAFCB-M2042-A300-C0
S/FTP 1200/22-35	35 m	1/1	CCAFCB-M2042-A350-C0
S/FTP 1200/22-40	40 m	1/1	CCAFCB-M2042-A400-C0
S/FTP 1200/22-45	45 m	1/1	CCAFCB-M2042-A450-C0
S/FTP 1200/22-50	50 m	1/1	CCAFCB-M2042-A500-C0
S/FTP 1200/22-55	55 m	1/1	CCAFCB-M2042-A550-C0
S/FTP 1200/22-60	60 m	1/1	CCAFCB-M2042-A600-C0
S/FTP 1200/22-65	65 m	1/1	CCAFCB-M2042-A650-C0
S/FTP 1200/22-70	70 m	1/1	CCAFCB-M2042-A700-C0
S/FTP 1200/22-75	75 m	1/1	CCAFCB-M2042-A750-C0
S/FTP 1200/22-80	80 m	1/1	CCAFCB-M2042-A800-C0
S/FTP 1200/22-85	85 m	1/1	CCAFCB-M2042-A850-C0
S/FTP 1200/22-90	90 m	1/1	CCAFCB-M2042-A900-C0
S/FTP 1200/22-95	95 m	1/1	CCAFCB-M2042-A950-C0

FutureCom™ F

Plug & Play™ Solutions, S1200 - S250

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ F consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded S1200 connector in compliance with IEC 61076-3-104 and one S250 module.
The zero halogen consolidation point cables (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-3, Category C and EN 50266-2-4.

They are available in various lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- S/FTP flex cable, Category 7
- Outstanding transmission characteristics according to 10GBase-T

Ordering Information

Description	Length	Units per Delivery	Order Number
S1200 consolidation point cable, S/FTP 1200/22, 4 pairs, shielded, FRNC jacket, blue, application-neutral, pre-terminated with one S250 module and one S1200/4 connector			
S/FTP 1200/22-5	5 m	**1/1**	**CCAFCB-M2058-A050-C0**
S/FTP 1200/22-10	10 m	**1/1**	**CCAFCB-M2058-A100-C0**
S/FTP 1200/22-15	15 m	**1/1**	**CCAFCB-M2058-A150-C0**
S/FTP 1200/22-20	20 m	**1/1**	**CCAFCB-M2058-A200-C0**

3 FutureCom™ 10TENe

3.1. System Overview 54

3.2. Certificates 57

3.3. Cables

3.3.1. S/FTP 1000/22 58

3.3.2. S/FTP 1000/23 60

3.3.3. S/FTP 800/23 62

3.3.4. S/FTP 550/23 64

3.4. Hardware

3.4.1. S10TENe Module Technology 66

3.4.2. S10TENe Module and Accessories 67

3.4.3. S10TENe Outlets 69

3.4.4. S10TENe Patch Panels 70

3.5. Patch Cords 71

3.6. Plug & Play™ Solutions

3.6.1. S10TENe Solution Package, 1x S/FTP1000/23, 2S 72

3.6.2. S10TENe Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 73

3.6.3. S10TENe Solution Package, 6x S/FTP1000/23, 2S, sewed 74

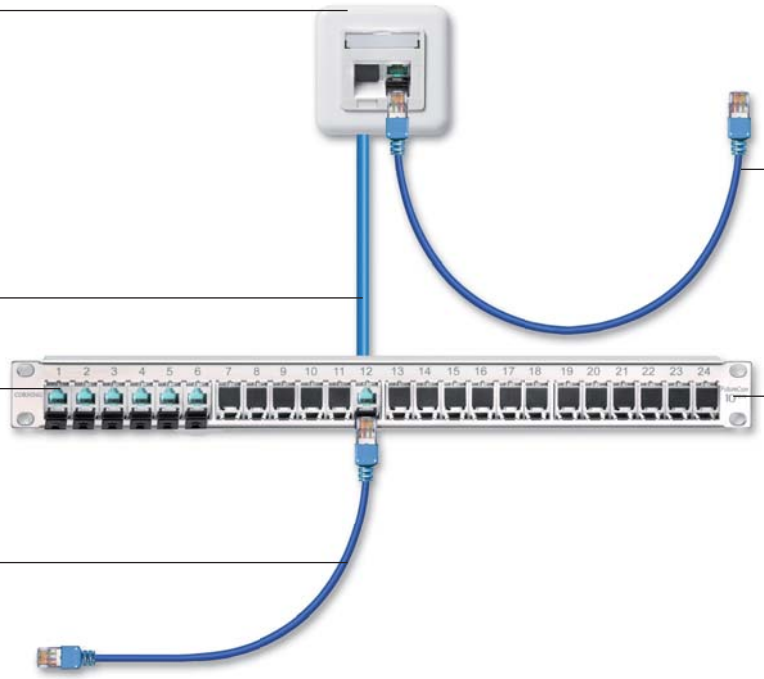
3.6.4. S10TENe Consolidation Point Patch Cords 75

3.7. Universal Test Cable 76

FutureCom™ 10TENe

System Overview

Corning Cable Systems' FutureCom™ 10TENe System has been especially developed to support 10 Gigabit Ethernet (10GBase-T) over 100 metres. FutureCom 10TENe is the latest addition to LANscape® Pretium™ Solutions, Corning Cable Systems' high-performance fibre and copper solutions for premises networks, and is fully compliant with the IEEE 802.3an and the new class E_A (ISO/IEC 11801 AMD 1: 2008) standard for 10 Gigabit Ethernet transmission. The current FutureCom 10TENe is especially designed for 10 Gigabit applications in riser and horizontal environments, avoiding alien near-end and far-end cross talk (ANEXT, AFEXT), in order to warrant the higher performance of cabling through immunity. The system is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.



Face Plate "DELTAprofil",
80 x 80 mm
WAXWSE-00000-C001
and **S10TENe Outlet**,
2x RJ45, inclined,
10GBase-T,
CAXTSD-S0201-C002

FutureCom
S/FTP 1000/23
CCXEDB-I0047-C001-L7

S10TENe Module,
1x RJ45, shielded,
10GBase-T,
CAXTSM-00112-C002

S/FTP flex/26 Patch Cord,
blue,
2x RJ45 connector,
4 pairs,
for up to 10GBase-T
CCATGB-G2002-A030-C0

S/FTP flex/26 Patch Cord,
blue,
2x RJ45 connector,
4 pairs,
for up to 10GBase-T
CCATGB-G2002-A020-C0

S10TEN Patch Panel 19",
for up to 24 S10TEN Modules,
1 U, high-grade steel
WAXTSV-02400-C001

A very high level of system performance is achieved for the link through the use of high-quality 10GBase-T connection technology, Category 6_A to 7_A cables and 10GBase-T patch cords. The resulting performance and the future security guarantee maximum investment protection.

Fully configured with RJ45 connectors and RJ45 modules, the cabling is application-neutral and can be used universally.

The FutureCom 10TENe system is suitable for all recognised standardised voice and data transmission applications up to 10GBase-T.

The performance of the FutureCom 10TENe cabling system has been certified by an independent testing body (see certificate). Of course, all standardised EMC threshold values in Europe are observed.

FutureCom™ 10TENe

System Data for Channel Class E_A

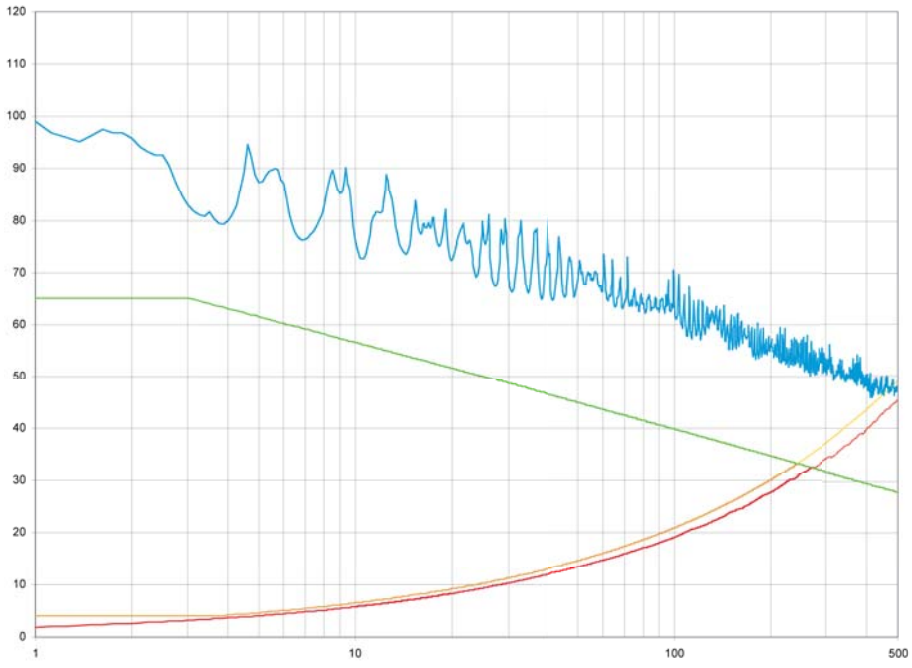
Electrical characteristics (at 20°C)

Frequency [MHz]	1	10	20	62.5	100	155.5	200	250	500
Max. attenuation according to standard [dB]*	4	6.5	9.2	16.4	20.9	26.3	30.1	33.9	49.3
Typical attenuation [dB]	**1.9**	**5.7**	**8.3**	**15.0**	**19.1**	**24.2**	**27.7**	**31.4**	**45.6**
Min. NEXT values according to standard [dB]*	65	56.6	51.6	43.4	39.9	36.7	34.8	33.1	27.9
Typical NEXT values [dB]	**99.0**	**76.3**	**72.5**	**65.0**	**64.3**	**56.3**	**56.0**	**54.8**	**48.0**
Min. ACR values according to standard [dB]*	61	50.1	42.5	27.0	19.0	10.4	4.7	-0.8	-21.4
Typical ACR values [dB]	**97.1**	**70.6**	**64.2**	**50**	**45.2**	**32.1**	**21.2**	**23.4**	**2.4**
Min. ELFEXT values according to standard [dB]*	63.3	43.3	37.2	27.3	23.3	19.4	17.2	15.3	9.3
Typical ELFEXT values [dB]	**87.2**	**68.9**	**63.3**	**50.5**	**49.0**	**45.6**	**40.9**	**37.9**	**30.2**
Min. return loss according to standard [dB]*	19	19.0	17.5	14.0	12.0	10.1	9.0	8.0	6
Typical return loss [dB]	**25.0**	**30.2**	**40.3**	**30.8**	**25.8**	**24.6**	**25.4**	**27.4**	**27.9**

* According to ISO/IEC 11801 Amd 1:2008

The system values cited only apply to the use of original FutureCom 10TENe products. Derived values, such as PSACR, PSNEXT, PSELFEXT, also comply with the standard values, but are not shown.

dB



Frequency in MHz

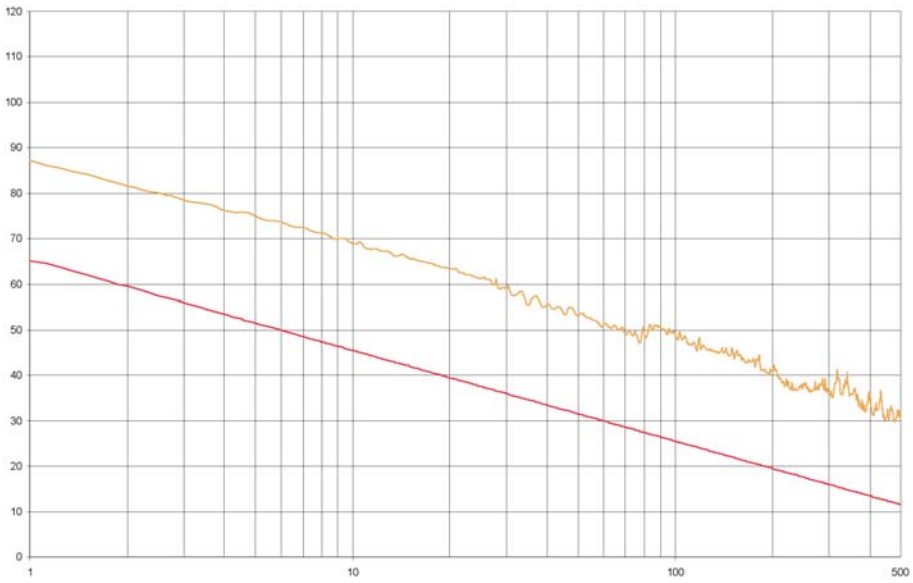
Attenuation and Near-end Crosstalk (NEXT)

- Typical NEXT values [dB]
- Min. NEXT values according to standard [dB]
- Typical attenuation [dB]
- Max. attenuation according to standard [dB]

FutureCom™ 10TENe

System Data for Channel Class E_A

dB

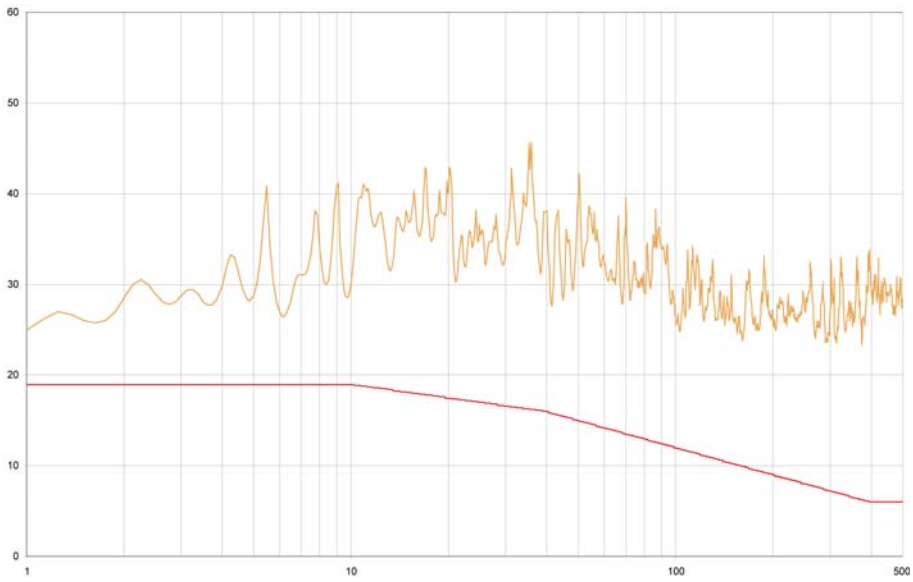


Frequency in MHz

Far-end Crosstalk relating to the Far End (ELFEXT)

- Typical ELFEXT values [dB]
- Min. ELFEXT values according to standard [dB]

dB



Frequency in MHz

Return Loss

- Typical return loss [dB]
- Min. return loss according to standard [dB]

Test Setup

- FutureCom 10TEN test cord, 2 m
- S10TENe Module
- 90 m FutureCom S/FTP 1000/23 cable
- S10TEN Patch Panel 19“
- FutureCom 10TEN test cord, 2 m

Nominal intrinsic impedance	100 Ω
Max. DC loop resistance (according to standard)	40 Ω
DC loop resistance (typ. system values)	18 Ω
Max. delay skew (according to standard)	0.05 µs
Delay skew (typ. system values)	<0.02 µs

Certificates

Certificate

Customer: **Corning Cable Systems GmbH & Co. KG**
Austrasse 101
D-96460 Neustadt/Coburg

Description:

Modular Jack	**Corning FutureCom S 10TENe Modul 1xRJ45 shielded Class Ea** Part-No.: CAXTSM-00112-C002
Data Cable 84m	**Corning FutureCom S/FTP1000/22 4P LSOH-3** Part-No.: CCXFCB-10047-C001
Patchcord 2 x 2m	**Corning FutureCom S 10TEN Patch Cord S/FTP flex/26 2xRJ45 Cat.6** Part-No.: CCATGB-Gx002-Ayyy
CP-cable 2 x 3m	**Corning FutureCom S 10TEN Patch Cord S/FTP flex/26 2xRJ45 Cat.6** End A: Modular jack; End B: RJ45- Plug Part-No.: CCATGB-Gx002-Ayyy + CAXTSM-00112-C002

Applied standards: TIA/EIA-568-B.2-10 (Draft 7.0)
Transmission performance specifications for 4-pair 100 Ω augmented category 6 cabling (Category 6A)

ISO/IEC 11801 Amendment 1 JTC 1/SC N1255
Information technology – Generic cabling for customer premises

Results: Up to a bandwidth of **500MHz** the sample, a **4-Connector-Channel**, meet the **Class Ea** limits of the specified standards and regulations.

PS ANEXT and PS AACR-F met by design for Class Ea, because the result of the Coupling Attenuation is better than 50 dB at 30 MHz < f < 100 MHz and 90 -20*log(f) dB at 100 MHz < f < 1.000 MHz. The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1775a-07-E, from September 14th 2007** and shall only be applicable in conjunction with the test report.

Bexbach, September 14th 2007

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Phone: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

PREMIUM Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austrasse 101
D-96460 Neustadt / Coburg

Description: **Corning FutureCom S 10TENe module 1xRJ45 shielded Class Ea**

Part-No.: **CAXTSM-00112-C002**

Applied standards: ISO/IEC 11801: 2002-09
Information technology – Generic cabling for customer premises

EN 50173-1: 2002
Information technology – Generic cabling systems Part 1

IEC 60603-7-5 / Ed. 1.0 (ACDV 09.2003): Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for Data transmissions with frequencies up to 250 MHz (Cat 6, shielded) - 2003

TIA/EIA-568-B.2-1 (Addendum No.1 to TIA/EIA-568-B.2) - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 6 Cabling

Comments: Up to a bandwidth of 250 MHz, the sample, a Connectivity, meets the limits of the specified standards and regulations. All pin-combinations provide an interoperable conformity of the **Connectivity** and comply with the requirements of the **Category 6** threshold values.

This certificate, based on participation in the **GHMT PREMIUM Verification Program**, authorizes to apply the GHMT PREMIUM marking. Ongoing compliance with the specifications is monitored within the framework of regular sampling, which cannot be influenced by the customer, thus defining high standards as regards continuous manufacturing quality.

This Certificate refers to the comprehensive test report, **no. P1776b-07-E, from May 09th 2008** and shall only be applicable in conjunction with the test report.

Bexbach, May 09th 2008

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

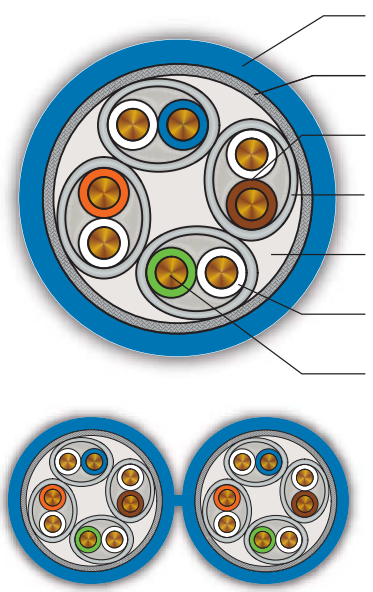
GHMT AG
In der Kolling 13
D-66450 Bexbach
Phone: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

valid until: September 30th 2008

GHMT Aktiengesellschaft

FutureCom™ 10TENe

S/FTP 1000/22, Cat. 7A Cables



Application

The FutureCom™ S/FTP 1000/22 cable is designed for applications up to 1000 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1000/22 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<2 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.6**	**4.9**	**6.4**	**7**	**9**	**12.8**	**16.5**	**28.9**	**41.9**	**47.7**	**54.9**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**97**	**93**	**88**	**84**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**95**	**91**	**86**	**82**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**96**	**96**	**96**	**96**	**93**	**88**	**82**	**70**	**55**	**45**	**40**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**94**	**94**	**94**	**94**	**91**	**86**	**80**	**68**	**53**	**43**	**38**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.4**	**95.1**	**93.6**	**93**	**91**	**87.2**	**83.5**	**68.1**	**51.1**	**40.3**	**29.1**

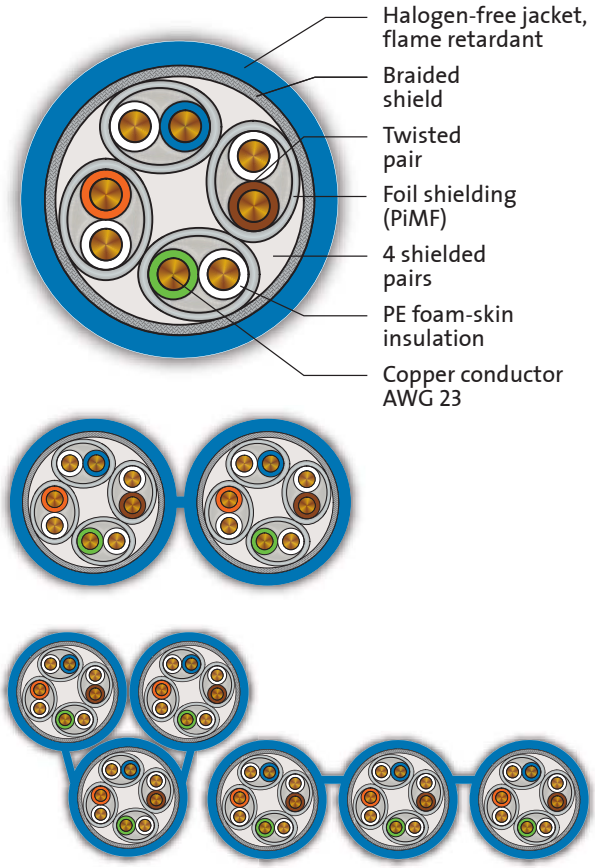
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 1000/22 4P	7_A	4	0.63	Yes	blue	167	7.5	62	1000	**CCXFCB-I0047-C001-L7**
S/FTP 1000/22 8P	7_A	8	1.29	Yes	blue	334	7.5 x 16.0	125	500	**CCXFCB-I0087-C001-L6**

FutureCom™ 10TENe

S/FTP 1000/23, Cat. 7A Cables



Application

The FutureCom™ S/FTP 1000/23 cable is designed for applications up to 1000 MHz and tis transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 1000/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 1000/23 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**900**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.7**	**5.0**	**6.5**	**7.3**	**9.2**	**13.2**	**16.8**	**30**	**42.5**	**55**	**59**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**96**	**92**	**86**	**83**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**94**	**90**	**84**	**81**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**83.2**	**66.0**	**49.5**	**31**	**24**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

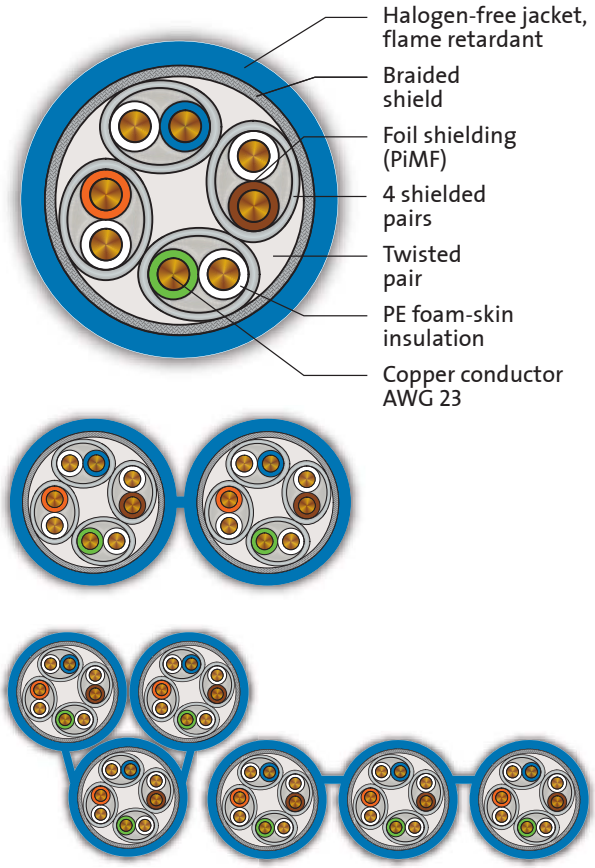
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-I0047-C001-L7**
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-I0047-C001-X2***
S/FTP 1000/23 8P	7_A	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-I0087-C001-L6**
S/FTP 1000/23 12P	7_A	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-I0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TENe

S/FTP 800/23, Cat. 7 Cables



Application

The FutureCom™ S/FTP 800/23 cable is designed for applications up to 800 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 800/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 800/23 cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

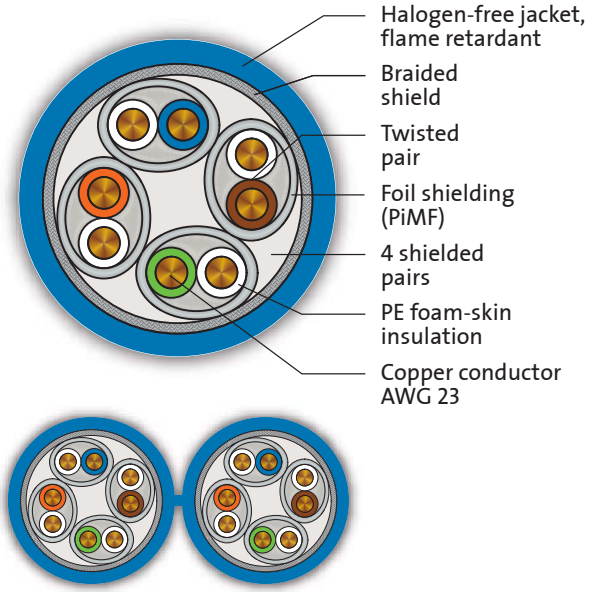
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-F0047-C001-L7**
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-F0047-C001-X2***
S/FTP 800/23 8P	7	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-F0087-C001-L6**
S/FTP 800/23 12P	7	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-F0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TENe

S/FTP 550/23, Cat. 6$_A$ Cables



Application

The FutureCom™ S/FTP 550/23 cable is designed for applications up to 550 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1 and IEC 61156-5

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 550/23 cable specified up to 550 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**550**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	6	10.8	15.5	19.9	33	-
Typical attenuation [dB/100 m]	**1.8**	**5.3**	**6.8**	**7.6**	**9.6**	**13.6**	**17.3**	**27.7**	**42.6**
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	59.3	51.9	47.4	44.3	3.3	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**97**	**95**	**90.0**	**77.2**
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	57.3	49.9	45.4	42.3	36	-
Typical PSNEXT values [dB/100 m]	**98.0**	**98**	**98**	**98**	**98**	**95**	**93**	**88**	**75.2**
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	50	40.1	34.1	30	3	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**70**	**50.8**
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	47	37.1	31.1	27	22	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**68**	**48.8**
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	53.3	41.1	31.9	24.4	5.3	-
Typical ACR values [dB/100 m]	**98.2**	**94.7**	**93.2**	**92.4**	**90.4**	**83.4**	**77.7**	**62.3**	**34.6**

* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	1000	**CCXEDB-D0047-C001-L7**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	250	**CCXEDB-D0047-C001-X2***
S/FTP 550/23 8P	6_A	8	1.16	Yes	blue	290	7.2 x 15.5	113	500	**CCXEDB-D0087-C001-L6**

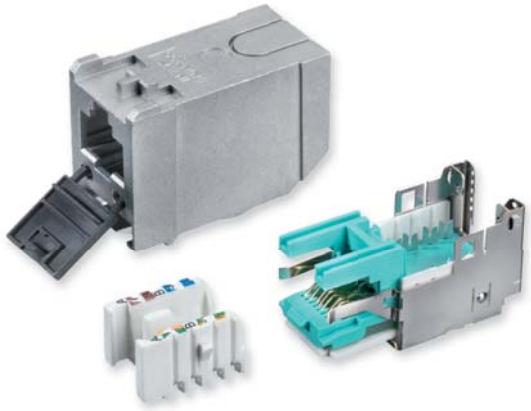
* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TENe

S10TENe Module Technology

Features

- Fully compatible with all modular LANscape® systems
- Wide range of installation options
- Compact design, only 3 individual components
- High-level component density
- 360° shielding by solid die cast module housing
- Cable strain relief without cable tie
- Halogen-free
- Flame retardant, fire Class UL94 V-0



FutureCom S10TENe Technology

- Module performance according to EN 50173, ISO/IEC 11801 and IEC 60603-7-5 Ed.1.0
- More than 1500 connector cycles possible
- Proven IDC technology for wires with AWG 24 to AWG 22
- Integrated, flexible dust protection lid (removable)
- Module reusable several times

Application

- Wire management using TIA/EIA 568 A/B coding
- Installation in pairs (no untwisting of pairs necessary)
- Rapid assembly time
- Easy handling
- Invinitely variable 0° to 90° cable access with 360° shielding and cable strain relief
- Compatible with all FutureCom S/FTP and F/FTP cables

S10TENe Module and Accessories

Application

The FutureCom S10TENe module offers high system margins for transmission of digital data signals for future applications in systems up to 10GbE according to the new class E_A (ISO/IEC 11801 Amd 1: 2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The module is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets. The individual single shielding of the modules (in compliance to EN 50174) is absolutely necessary for these high bit rate applications.

Features

- Quick and easy to install
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- High density
- Universal application in all modular LANscape® components
- 10GBase-T
- De-embedded tested according to IEC 60603-7-5 (2003) Cat.6 and class E_A

Description	Units per Delivery	Order Number
S10TENe Module, 1x RJ45, shielded, 10GBase-T for class E_A, wire management with TIA/EIA 568 A/B printing, for installation in LANscape modular patch panels, outlets and floor box solutions		
aqua	1/1	CAXTSM-00112-C002

Description	Units per Delivery	Order Number
S10TENe Keystone Module, 1x RJ45, shielded, 10GBase-T for class E_A, wire management with TIA/EIA 568 A/B printing, for installation in Keystone patch panels, outlets and floor solutions		
aqua	1/1	CAXTSM-00112-C003

FutureCom™ 10TENe

S10TENe Module and Accessories

Features

- Using the additional cable strain relief allows increased pulling force on the module housings

Cable Strain Relief

Description	Units per Delivery	Order Number
Additional strain relief for absorbing high forces and screen on the S10TENe modules for 90° cable installation		
silver	100/1	CAXASN-00000-C002

Description	Units per Delivery	Order Number
Additional strain relief for absorbing high forces and screen on the S10TENe modules for 0° cable installation		
silver	100/1	CAXASN-00000-C003

Assembly Tool for S10TENe Modules

Description	Units per Delivery	Order Number
Assembly tool for connecting FutureCom™ S10TENe basic module with wire management		
metal	1/1	CAXCSN-00000-C009

Copper Conducting Tape 9 x 45 mm

Description	Units per Delivery	Order Number
Copper conducting tape 9 x 45 mm on roll, for FutureCom modules		
9 x 45 mm	1000/1	CAXCSN-00000-C011

S10TENe Outlets

Application

The FutureCom S10TENe inclined outlet offers high system margins for transmission of digital data signals for future applications in systems up to 10GbE according to the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The outlet is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets.

Features

- Quick and easy to install
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- 10GBase-T
- De-embedded tested according to IEC 60603-7-5 (2003) Cat.6 and class E_A

Description	Units per Delivery	Order Number
S10TENe Outlet, 2x RJ45, shielded, 10GBase-T for class E_A, inclined, incl. mounting frame with grounding flaps, central plate 50 x 50 mm with designation window, screw fixing (without faceplate)		
white, RAL 9010	1/1	CAXTSD-S0201-C002
pearl white, RAL 1013	1/1	CAXTSD-S0202-C002

FutureCom™ 10TENe

S10TENe Patch Panels

Application

The FutureCom™ S10TENe patch panels offer high system margins for transmission of digital data signals for future applications in systems up to 10GbE according to the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
It is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.

No special tools are required for either the termination of modules onto cables and the installation of the modules into the patch panel.

Features

- Easy and quick installation of system modules
- Recyclable, high-grade steel, stainless
- Two standardised grounding latches
- Integrated cable strain relief for optimal strain relief of each cable
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- 10GBase-T
- De-embedded tested according to IEC 60603-7-5 (2003) Cat.6 and class E_A
- For Patch Panel accessories see page 209

Description	Units per Delivery	Order Number
S10TENe Patch Panel 19“, shielded, 10GBase-T for class E_A, including 24 FutureCom S10TENe modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	CAXTSV-02400-C002
black	1/1	CAXTSV-02408-C002

FutureCom™ 10TENe

Patch Cords, RJ45 - RJ45

Description

The application-neutral FutureCom™ 10TEN 10GBase-T patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with a shielded RJ45 connectors on each end.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
FutureCom 10TEN patch cords provide additional latch protection.

They are available in various lengths and colours.

Features

- S/FTP flex cable, Category 7
- Application-neutral due to using all four pairs of RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to 10GBase-T
- Additional latch protection

Ordering Information

Length	grey	blue	yellow	green	red	black
1 m	CCATGB-G1002-A010-C0	CCATGB-G2002-A010-C0	CCATGB-G3002-A010-C0	CCATGB-G4002-A010-C0	CCATGB-G5002-A010-C0	CCATGB-G6002-A010-C0
2 m	CCATGB-G1002-A020-C0	CCATGB-G2002-A020-C0	CCATGB-G3002-A020-C0	CCATGB-G4002-A020-C0	CCATGB-G5002-A020-C0	CCATGB-G6002-A020-C0
3 m	CCATGB-G1002-A030-C0	CCATGB-G2002-A030-C0	CCATGB-G3002-A030-C0	CCATGB-G4002-A030-C0	CCATGB-G5002-A030-C0	CCATGB-G6002-A030-C0
5 m	CCATGB-G1002-A050-C0	CCATGB-G2002-A050-C0	CCATGB-G3002-A050-C0	CCATGB-G4002-A050-C0	CCATGB-G5002-A050-C0	CCATGB-G6002-A050-C0
10 m	CCATGB-G1002-A100-C0	CCATGB-G2002-A100-C0	CCATGB-G3002-A100-C0	CCATGB-G4002-A100-C0	CCATGB-G5002-A100-C0	CCATGB-G6002-A100-C0

Other lengths upon request

FutureCom™ 10TENe

Plug & Play™ Solutions, S10TENe - S10TENe

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S10TENe Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1: 2008) respectively Cat.6_A (ANSI/TIA/EIA 568B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The S/FTP 1000/23 cable is factory pre-terminated with an S10TENe module at each end.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TENe Solution Package, S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S10TENe modules			
S/FTP 1000/23-10	10 m	1/1	CCATDB-F2067-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCATDB-F2067-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCATDB-F2067-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCATDB-F2067-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCATDB-F2067-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCATDB-F2067-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCATDB-F2067-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCATDB-F2067-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCATDB-F2067-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCATDB-F2067-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCATDB-F2067-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCATDB-F2067-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCATDB-F2067-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCATDB-F2067-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCATDB-F2067-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCATDB-F2067-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCATDB-F2067-A900-C0

FutureCom™ 10TENe

Plug & Play™ Solutions, 6x S10TENe - 6x S10TENe

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S10TENe Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S10TENe modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

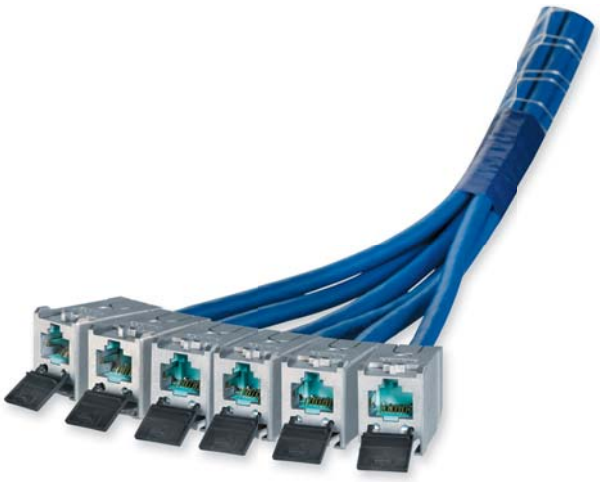
Description	Length	Units per Delivery	Order Number
S10TENe Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10TENe modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCATDB-F2667-A100-C0
6x S/FTP 1000/23-20	20 m	1/1	CCATDB-F2667-A200-C0
6x S/FTP 1000/23-30	10 m	1/1	CCATDB-F2667-A300-C0
6x S/FTP 1000/23-40	40 m	1/1	CCATDB-F2667-A400-C0

FutureCom™ 10TENe

Plug & Play™ Solutions, 6x S10TENe - 6x S10TENe

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring



Description

The FutureCom™ sextuple S10TENe Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S10TENe modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TENe Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10TENe modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCATDB-F2667-A100-EN
6x S/FTP 1000/23-20	20 m	1/1	CCATDB-F2667-A200-EN
6x S/FTP 1000/23-30	30 m	1/1	CCATDB-F2667-A300-EN
6x S/FTP 1000/23-40	40 m	1/1	CCATDB-F2667-A400-EN

FutureCom™ 10TENe

Plug & Play™ Solutions, S10TENe Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ 10TENe consolidation point cable has four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). It is assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S10TENe module.
The FutureCom™ 10TENe consolidation point cable offers high margins for transmission of digital data signals for future applications in systems up to 10GbE according to the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0. It is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 500 MHz in compliance with Class E_A and IEEE 802.3an
- S/FTP flex cable, Category 7
- High-quality RJ45 connector for 10 GbE systems
- Connector boot with latch protection

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TENe consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S10TENe module and one RJ45 connector			
S/FTP flex/26-5	5 m	1/1	CCATGB-F1066-A050-C0
S/FTP flex/26-10	10 m	1/1	CCATGB-F1066-A100-C0
S/FTP flex/26-15	15 m	1/1	CCATGB-F1066-A150-C0
S/FTP flex/26-20	20 m	1/1	CCATGB-F1066-A200-C0

FutureCom™ 10TENe

Universal Test Cable

Application

The universal channel test cord can be used for acceptance tests of shielded FutureCom™ 10TEN Systems in conjunction with the universal test adapter from Fluke or other test device manufacturers.

One pair of these test cords is required for acceptance tests.

Ordering Information

Description	Length	Units per Delivery	Order Number
Universal Test Cord, for the acceptance test of the FutureCom 10TEN system in conjunction with the universal test adapter from Fluke or other test device manufacturers, 2x RJ45, 4 pairs			
grey	3 m	1/1	CCATGB-F10M0-A030-C0

4 FutureCom™ 10TEN

4.1. System Overview 77

4.2. Certificates 81

4.3. Cables

4.3.1. S/FTP 1000/22 82

4.3.2. S/FTP 1000/23 84

4.3.3. S/FTP 800/23 86

4.3.4. S/FTP 550/23 88

4.4. Hardware

4.4.1. S10TEN Module Technology 90

4.4.2. S10TEN Module and Accessories 91

4.4.3. S10TEN Outlets 93

4.4.4. S10TEN Patch Panels 94

4.5. Patch Cords 96

4.6. Plug & Play™ Solutions

4.6.1. S10TEN Solution Package, 1x S/FTP1000/23, 2S 97

4.6.2. S10TEN Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 98

4.6.3. S10TEN Solution Package, 6x S/FTP1000/23, 2S, sewed 99

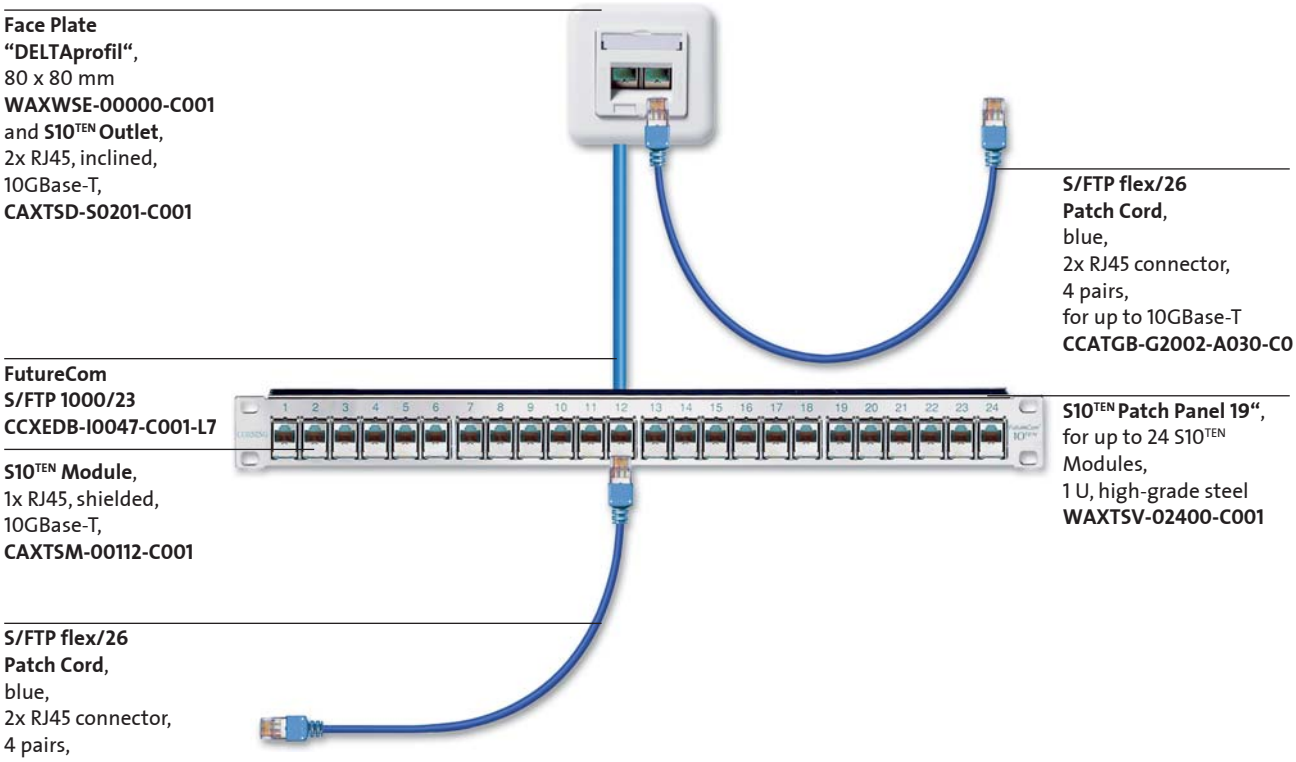
4.6.4. S10TEN Consolidation Point Patch Cords 100

4.7. Universal Test Cable 101

FutureCom™ 10TEN

System Overview

Corning Cable Systems' FutureCom™ 10TEN System has been especially developed to support 10 Gigabit Ethernet (10GBase-T) over 100 metres. FutureCom 10TEN system is fully compliant with the IEEE 802.3an standard for 10 Gigabit Ethernet transmission. It is especially designed for 10 Gigabit applications in riser and horizontal environments, avoiding alien near-end and far-end cross talk (ANEXT, AFEXT), in order to warrant the higher performance of cabling through immunity.



A very high level of system performance is achieved for the link through the use of high-quality 10GBase-T connection technology, Category 6_A to 7_A cables and 10GBase-T patch cords. The resulting performance and the future security guarantee maximum investment protection.

Fully configured with RJ45 connectors and RJ45 modules, the cabling is application-neutral and can be used universally.

The FutureCom 10TEN system is suitable for all recognised standardised voice and data transmission applications up to 10GBase-T.

The performance of the FutureCom 10TEN cabling system has been certified by an independent testing body (see certificate). Of course, all standardised EMC threshold values in Europe are observed.

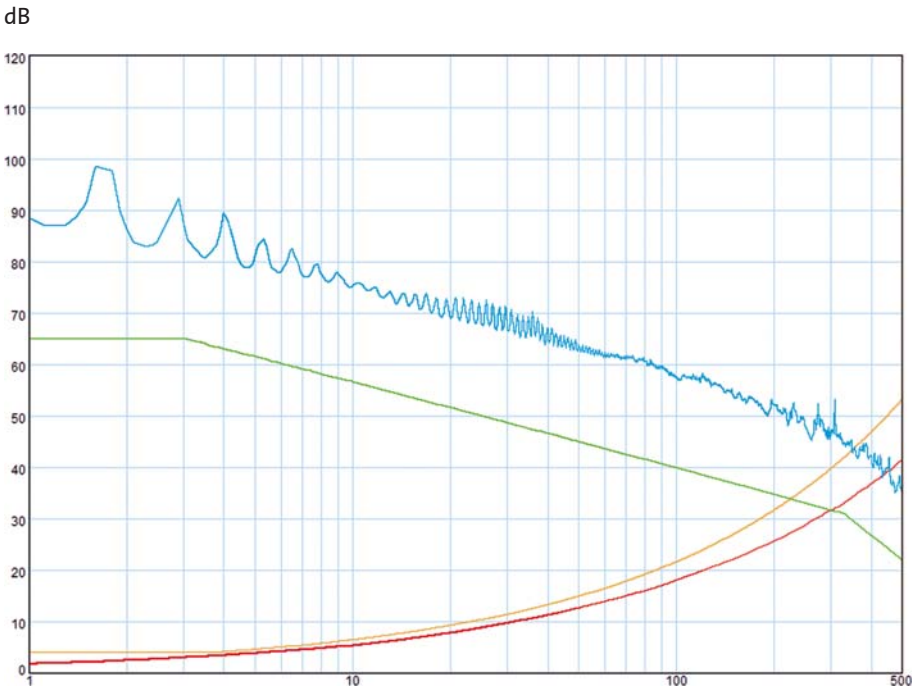
System Data for Channel 10GBase-T

Electrical characteristics (at 20°C)

Frequency [MHz]	1	10	20	62.5	100	155.5	200	250	500
Max. attenuation according to standard [dB]*	4	-	-	-	21.7	-	-	35.9	53.4
Typical attenuation [dB]	**2**	**5.6**	**8**	**14.3**	**18.1**	**22.7**	**25.7**	**28.8**	**41.9**
Min. NEXT values according to standard [dB]*	65	-	-	-	39.9	-	-	33.1	22
Typical NEXT values [dB]	**89.4**	**85.3**	**75**	**63.6**	**57.9**	**53.3**	**50.7**	**47.9**	**37.6**
Min. ACR values according to standard [dB]*	61	-	-	-	18.2	-	-	-2.8	-31.4
Typical ACR values [dB]	**88.1**	**78.5**	**66.6**	**49.5**	**40.1**	**31.3**	**25.8**	**20.2**	**-2**
Min. ELFEXT values according to standard [dB]*	63.3	-	-	-	23.3	-	-	15.3	9.3
Typical ELFEXT values [dB]	**80.4**	**61.9**	**56.4**	**52.9**	**51.8**	**44.3**	**41.0**	**38.1**	**31.3**
Min. return loss according to standard [dB]*	19	-	-	-	12.0	-	-	7.2	6
Typical return loss [dB]	**33.9**	**32.7**	**30.7**	**32.4**	**32.1**	**31.3**	**30.3**	**26.5**	**22.1**

* According to IEEE 802.3an

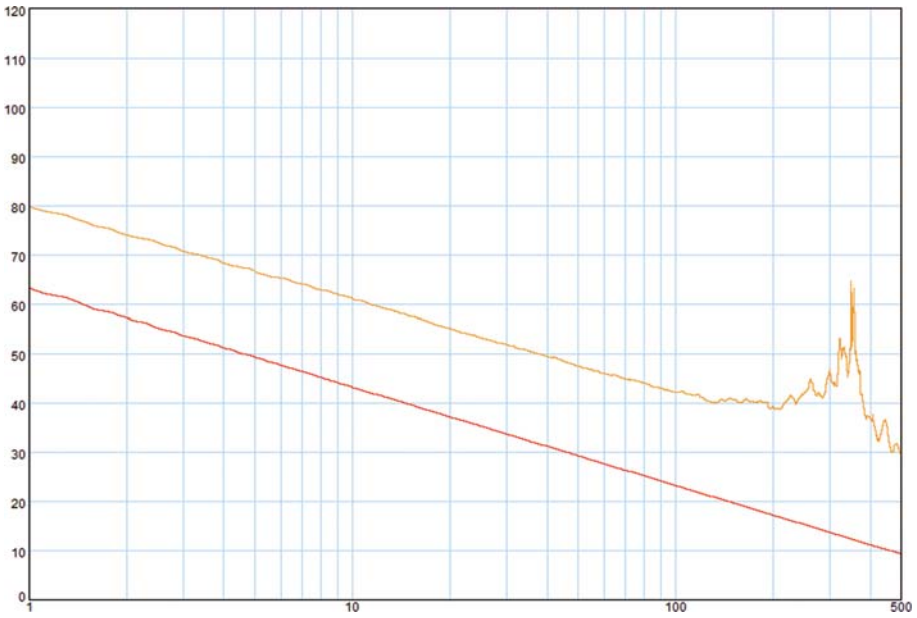
The system values cited only apply to the use of original FutureCom 10TEN products. Derived values, such as PSACR, PSNEXT, PSELFEXT, also comply with the standard values, but are not shown.



FutureCom™ 10TEN

System Data for Channel 10GBase-T

dB

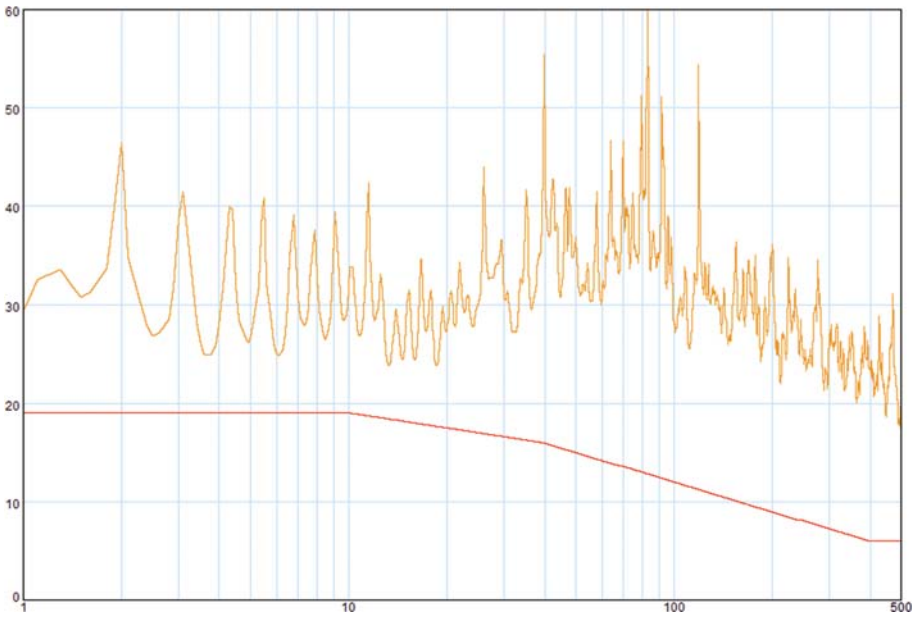


Frequency in MHz

Far-end Crosstalk relating to the Far End (ELFEXT)

- Typical ELFEXT values [dB]
- Min. ELFEXT values according to standard [dB]

dB



Frequency in MHz

Return Loss

- Typical return loss [dB]
- Min. return loss according to standard [dB]

Test Setup

- FutureCom™ 10TEN test cord, 2 m
- S10TEN Module
- 90 m FutureCom S/FTP 1000/23 cable
- S10TEN Patch Panel 19“
- FutureCom 10TEN test cord, 2 m

Nominal intrinsic impedance	100 Ω
Max. DC loop resistance (according to standard)	40 Ω
DC loop resistance (typ. system values)	18 Ω
Max. delay skew (according to standard)	0.05 µs
Delay skew (typ. system values)	<0.02 µs

Certificates

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austrasse 101
D-96460 Neustadt / Coburg

Description:

Modular Jack: **Corning S10TEN Modul 1xRJ45, 10GBaseT**
Art.-Nr.: CAXTSM-00112-C001

Data Cable: 90m **Corning FutureCom S-STP (S/FTP) 600/23 LSOH-3**
Art.-Nr.: CCXEDB-F0047-C001 & CCXEDB-F0087-C001

Patch Cable: 2x5m **Corning FutureCom 10TEN S-STP(S/FTP) flex/26/10GBaseT**
Art.-Nr.: CCATGB-G(X)002-A050-C0 (X=colour)

Applied standards:

TIA/EIA-568-B.2-10 (Draft 1.4, 2005-02)
Transmission performance specifications for 4-pair 100 Ω category 6 cabling - 2005

ANSI/TIA-TSB-155 (Draft 1.2, 2004-10)
Additional guidelines for 4-pair 100 Ω category 6 cabling for 10GBase-T applications – 2004

IEEE 802.3 AN Draft (April 04, 2005)
10 Gb/s operation over ISO/IEC 11801:2002 Class E and Class F channels with a new Physical Layer

Results: Up to a bandwidth of **500MHz,** the sample, a **Augmented Category 6 Channel (100m)**, meets the limits of the specified standards and regulations incl. PowerSum Alien Crosstalk.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1457a-05-E, from August 10th 2005** and shall only be applicable in conjunction with the test report.

Bexbach, August 10th 2005

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

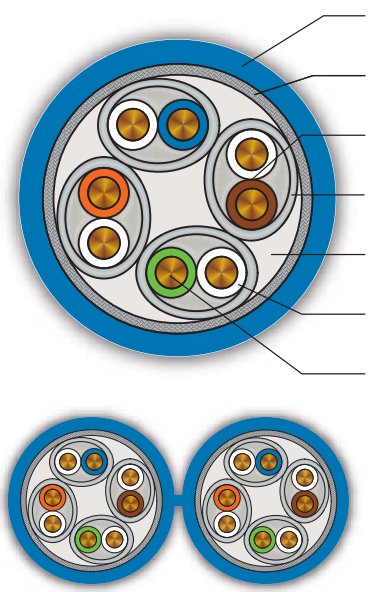
GHMT AG · In der Kolling 13 · 66450 Bexbach

GHMT AG
In der Kolling 13
D-66450 Bexbach
Phone: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

FutureCom™ 10TEN

S/FTP 1000/22, Cat. 7_A Cables



Application

The FutureCom™ S/FTP 1000/22 cable is designed for applications up to 1000 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable. They also allow multimedia applications such as TV transmission.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 1000/22 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥65 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 22

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<2 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	6 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.6**	**4.9**	**6.4**	**7**	**9**	**12.8**	**16.5**	**28.9**	**41.9**	**47.7**	**54.9**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**97**	**93**	**88**	**84**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**95**	**91**	**86**	**82**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**96**	**96**	**96**	**96**	**93**	**88**	**82**	**70**	**55**	**45**	**40**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**94**	**94**	**94**	**94**	**91**	**86**	**80**	**68**	**53**	**43**	**38**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.4**	**95.1**	**93.6**	**93**	**91**	**87.2**	**83.5**	**68.1**	**51.1**	**40.3**	**29.1**

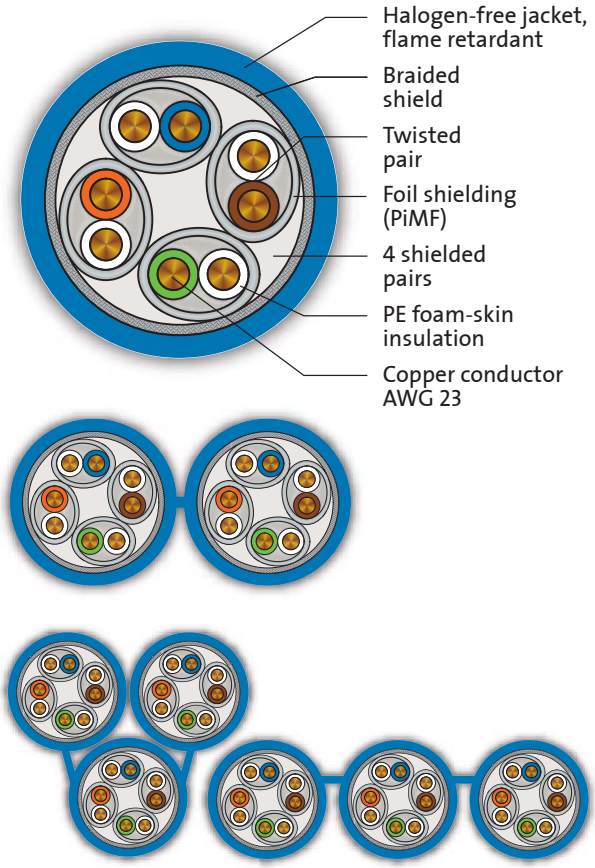
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 1000/22 4P	7_A	4	0.63	Yes	blue	167	7.5	62	1000	**CCXFCB-I0047-C001-L7**
S/FTP 1000/22 8P	7_A	8	1.29	Yes	blue	334	7.5 x 16.0	125	500	**CCXFCB-I0087-C001-L6**

FutureCom™ 10TEN

S/FTP 1000/23, Cat. 7_A Cables



Application

The FutureCom™ S/FTP 1000/23 cable is designed for applications up to 1000 MHz and tis transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 1000/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 1000/23 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**900**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.7**	**5.0**	**6.5**	**7.3**	**9.2**	**13.2**	**16.8**	**30**	**42.5**	**55**	**59**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**96**	**92**	**86**	**83**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**94**	**90**	**84**	**81**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**83.2**	**66.0**	**49.5**	**31**	**24**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

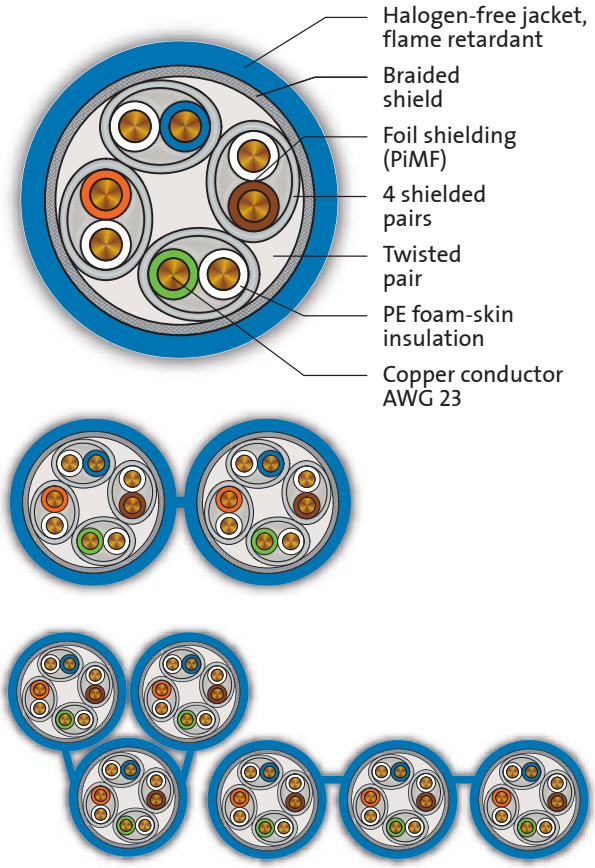
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-I0047-C001-L7**
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-I0047-C001-X2***
S/FTP 1000/23 8P	7_A	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-I0087-C001-L6**
S/FTP 1000/23 12P	7_A	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-I0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TEN

S/FTP 800/23, Cat. 7 Cables



Application

The FutureCom™ S/FTP 800/23 cable is designed for applications up to 800 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 800/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 800/23 cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

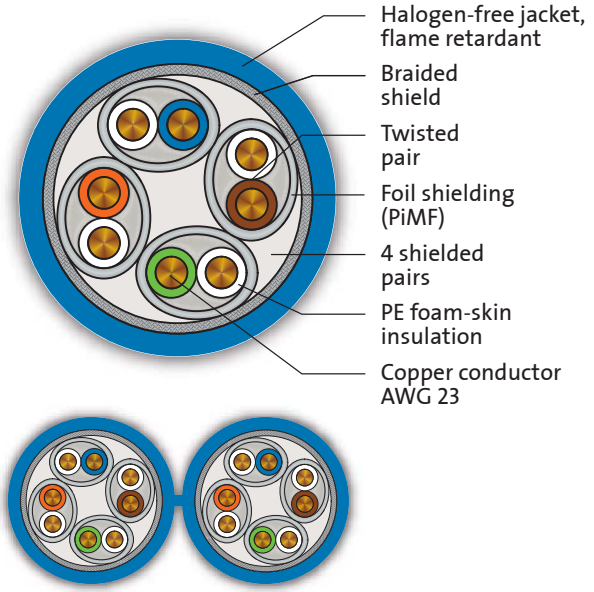
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-F0047-C001-L7**
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-F0047-C001-X2***
S/FTP 800/23 8P	7	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-F0087-C001-L6**
S/FTP 800/23 12P	7	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-F0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TEN

S/FTP 550/23, Cat. 6_A Cables



Application

The FutureCom™ S/FTP 550/23 cable is designed for applications up to 550 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1 and IEC 61156-5

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 550/23 cable specified up to 550 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**550**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	6	10.8	15.5	19.9	33	-
Typical attenuation [dB/100 m]	**1.8**	**5.3**	**6.8**	**7.6**	**9.6**	**13.6**	**17.3**	**27.7**	**42.6**
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	59.3	51.9	47.4	44.3	3.3	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**97**	**95**	**90.0**	**77.2**
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	57.3	49.9	45.4	42.3	36	-
Typical PSNEXT values [dB/100 m]	**98.0**	**98**	**98**	**98**	**98**	**95**	**93**	**88**	**75.2**
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	50	40.1	34.1	30	3	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**70**	**50.8**
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	47	37.1	31.1	27	22	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**68**	**48.8**
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	53.3	41.1	31.9	24.4	5.3	-
Typical ACR values [dB/100 m]	**98.2**	**94.7**	**93.2**	**92.4**	**90.4**	**83.4**	**77.7**	**62.3**	**34.6**

* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	1000	**CCXEDB-D0047-C001-L7**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	250	**CCXEDB-D0047-C001-X2***
S/FTP 550/23 8P	6_A	8	1.16	Yes	blue	290	7.2 x 15.5	113	500	**CCXEDB-D0087-C001-L6**

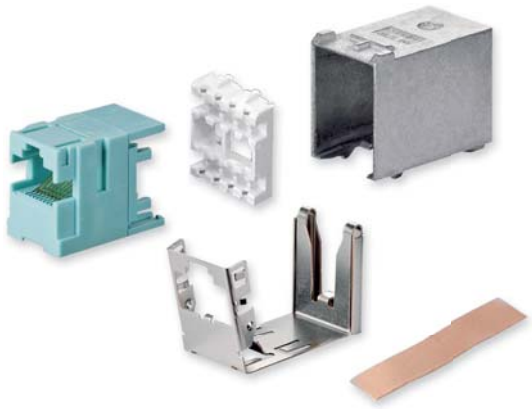
* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ 10TEN

S10TEN Module Technology

Features

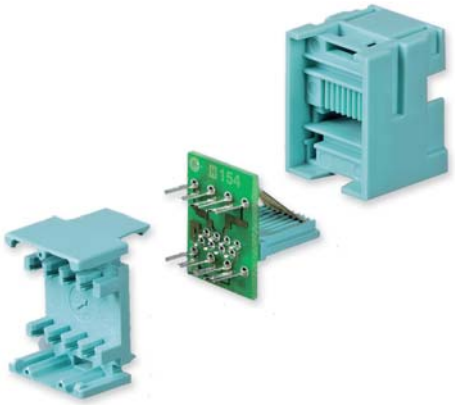
- Fully compatible with all modular LANscape® systems
- Wide range of installation options
- Few individual components
- High-level component density
- Individual shielding
- Halogen-free
- Flame retardant, fire Class UL94 V-0



Individual components of the S10TEN Module

FutureCom S10TEN Technology

- Optimised construction with printed circuit board for bandwith of more than 500 MHz
- More than 1500 connector cycles possible
- Proven IDC technology for wires with AWG 24 to AWG 22
- Module reusable several times



Disassembled S10TEN Basic Module

Application

- Wire management using TIA/EIA 568 A/B coding
- Installation in pairs (no untwisting of pairs necessary)
- Rapid assembly time
- Easy handling
- Compatible with all FutureCom S/FTP and F/FTP cables

S10TEN Wire Management, without/with cable

S10TEN Module and Accessories

S10TEN Module

- Quick and easy to install
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- High density
- Universal application in all modular LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules
- 10GBase-T

Description	Units per Delivery	Order Number
S10TEN Module, 1x RJ45, shielded, 10GBase-T, aqua module, white wire management with TIA/EIA 568 A/B printing, incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
aqua	1/1	CAXTSM-00112-C001

Cable Strain Relief

- Using the additional cable strain relief allows increased pulling force on the module housings

Description	Units per Delivery	Order Number
Additional cable strain relief, for higher pulling force on shielded FutureCom™ modules for solid wire, and for assembly of flexible consolidation point cables with FutureCom S10TENfx or S250fx modules		
silver	100/1	CAXCSN-00000-C001

FutureCom™ 10TEN

S10TEN Module and Accessories

Description

S10TENfx modules have to be assembled according to TIA/EIA 568 B when using Corning patch cords, in other case single-side terminated third party patch cords have to be installed like the RJ45 connector assignment. Assembling the modeule with flex cables the cable strain relief is recommended.

Features

- Quick and easy to install
- No special tools required
- High density
- Universal application in all modular LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules
- 10GBase-T

Description	Units per Delivery	Order Number
S10TENfx Module, 1x RJ45, shielded, 10Base-T, suitable for consolidation point cable with AWG 26 up to AWG 24 flex cables, incl. copper conducting tape for installation in LANscape® modular patch panels, outlets and floor box solutions		
aqua, wire management grey	1/1	CAXTSM-00112-C004

S10TEN Outlets

Application

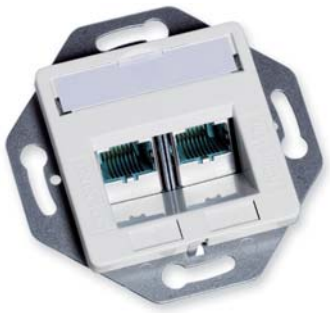
The FutureCom S10TEN inclined outlet is suitable for transmission of digital data signals for conventional applications in compliance with ISO/IEC 11801 (2002) and EN 50173-1 (2003).
It also offers outstanding system performance for transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an. Furthermore the outlet is also suitable for PoE applications in compliance with IEEE 802.3af (2003).

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets. The individual single shielding of the modules (in compliance to EN 50174) is absolutely necessary for these high bit rate applications.

Features

- Suitable for ISO 55-65 raceway, surface, flush or floor box mounting
- Stable galvanised frame with compact design and small dimensions
- No special tools required
- Single shielding of modules by sturdy die cast metal housing
- Recyclable
- Transmission characteristics in compliance with IEC 11801 (2002), EN 50173-1 (2003), IEEE 802.3an and IEEE 802.3af (2003) Power over Ethernet

Description	Units per Delivery	Order Number
S10TEN Outlet, 2x RJ45, 10GBase-T, shielded, inclined, incl. mounting frame with grounding flaps, central plate 50 x 50 mm with designation window, screw fixing, copper conducting tape (without faceplate)		
white, RAL 9010	1/1	CAXTSD-S0201-C001
pearl white, RAL 1013	1/1	CAXTSD-S0202-C001



FutureCom™ 10TEN

S10TEN Patch Panels

Application

The FutureCom S10TEN patch panel is suitable for transmission of digital data signals for conventional applications in compliance with ISO/IEC 11801 (2002) and EN 50173-1 (2003).
It also offers outstanding system performance for transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an. Furthermore the patch panel is also suitable for PoE applications in compliance with IEEE 802.3af (2003).

No special tools are required for either the termination of modules onto cables or the installation of the modules into patch panels. The individual single shielding of the modules (in compliance to EN 50174) is absolutely necessary for these high bit rate applications.

Features

- Easy and quick installation of system modules
- Recyclable, high-grade steel, stainless
- Two standardised grounding latches
- Integrated cable strain relief for optimal strain relief of each cable
- For Patch Panel accessories see page 209

S10TEN Patch Panel 19“, incl. 24 S10TEN modules

Description	Units per Delivery	Order Number
S10TEN Patch Panel 19“, shielded, 10GBase-T, including 24 FutureCom™ S10TEN modules and copper conducting tape, with integrated cable strain relief, 1 U, high-grade steel front panel		
high-grade steel	1/1	CAXTSV-02400-C001

S10TEN Patch Panels

Features

- Suitable for all LANscape® modules (FO and Copper)
- Robust metal construction, high-grade steel
- For Patch Panel accessories see page 209

FutureCom 10TEN Patch Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
FutureCom 10TEN Patch Panel 19“, for up to 24 FutureCom™ copper or LANscape fibre optic modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	WAXTSV-02400-C001

FutureCom 10TEN Patch Panel 19“, 1 U, black

Description	Units per Delivery	Order Number
FutureCom 10TEN Patch Panel 19“, for up to 24 FutureCom copper or LANscape fibre optic modules, with integrated cable strain relief, 1 U		
black	1/1	WAXTSV-02408-C001

FutureCom™ 10TEN

Patch Cords, RJ45 - RJ45

Description

The application-neutral FutureCom™ 10TEN 10GBase-T patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with a shielded RJ45 connectors on each end.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
FutureCom™ 10TEN patch cords provide additional latch protection.

They are available in various lengths and colours.

Features

- S/FTP flex cable, Category 7
- Application-neutral due to using all four pairs of RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to 10GBase-T
- Additional latch protection

Ordering Information

Length	grey	blue	yellow	green	red	black
1 m	CCATGB-G1002-A010-C0	CCATGB-G2002-A010-C0	CCATGB-G3002-A010-C0	CCATGB-G4002-A010-C0	CCATGB-G5002-A010-C0	CCATGB-G6002-A010-C0
2 m	CCATGB-G1002-A020-C0	CCATGB-G2002-A020-C0	CCATGB-G3002-A020-C0	CCATGB-G4002-A020-C0	CCATGB-G5002-A020-C0	CCATGB-G6002-A020-C0
3 m	CCATGB-G1002-A030-C0	CCATGB-G2002-A030-C0	CCATGB-G3002-A030-C0	CCATGB-G4002-A030-C0	CCATGB-G5002-A030-C0	CCATGB-G6002-A030-C0
5 m	CCATGB-G1002-A050-C0	CCATGB-G2002-A050-C0	CCATGB-G3002-A050-C0	CCATGB-G4002-A050-C0	CCATGB-G5002-A050-C0	CCATGB-G6002-A050-C0
10 m	CCATGB-G1002-A100-C0	CCATGB-G2002-A100-C0	CCATGB-G3002-A100-C0	CCATGB-G4002-A100-C0	CCATGB-G5002-A100-C0	CCATGB-G6002-A100-C0

Other lengths upon request

Plug & Play™ Solutions, S10TEN - S10TEN

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S10TEN Plug & Play Solution Packages are factory pre-terminated cables with S10TEN module at each end. They are generally offered with FutureCom S/FTP 1000/23 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

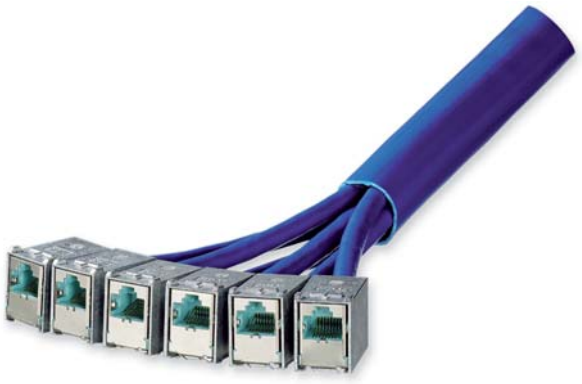
Description	Length	Units per Delivery	Order Number
S10TEN Solution Package, S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S10TEN modules			
S/FTP 1000/23-10	10 m	1/1	CCATDB-F2063-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCATDB-F2063-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCATDB-F2063-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCATDB-F2063-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCATDB-F2063-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCATDB-F2063-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCATDB-F2063-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCATDB-F2063-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCATDB-F2063-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCATDB-F2063-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCATDB-F2063-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCATDB-F2063-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCATDB-F2063-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCATDB-F2063-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCATDB-F2063-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCATDB-F2063-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCATDB-F2063-A900-C0

FutureCom™ 10TEN

Plug & Play™ Solutions, 6x S10TEN - 6x S10TEN

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring



Description

The FutureCom™ sextuple S10TEN Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an.
This special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S10TEN modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TEN Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10TEN modules at each end			
6x S/FTP 1000/23-10	10 m	**1/1**	**CCATDB-F2663-A100-C0**
6x S/FTP 1000/23-20	20 m	**1/1**	**CCATDB-F2663-A200-C0**
6x S/FTP 1000/23-30	30 m	**1/1**	**CCATDB-F2663-A300-C0**
6x S/FTP 1000/23-40	40 m	**1/1**	**CCATDB-F2663-A400-C0**

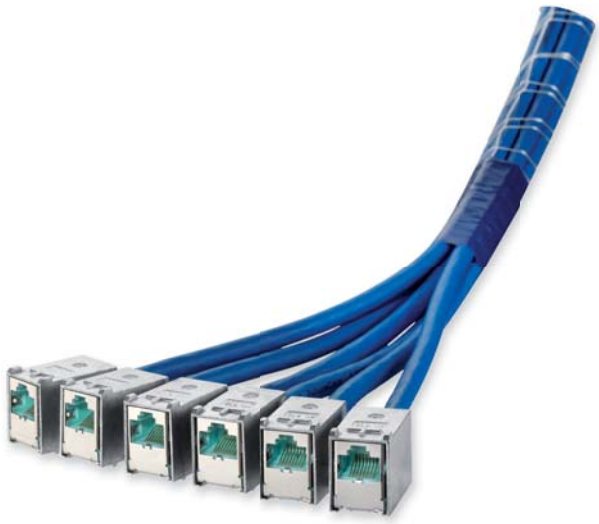
Plug & Play™ Solutions, 6x S10TEN - 6x S10TEN

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S10TEN Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S10TEN modules at each end.



Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TEN Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10TEN modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCATDB-F2663-A100-EN
6x S/FTP 1000/23-20	20 m	1/1	CCATDB-F2663-A200-EN
6x S/FTP 1000/23-30	30 m	1/1	CCATDB-F2663-A300-EN
6x S/FTP 1000/23-40	40 m	1/1	CCATDB-F2663-A400-EN

FutureCom™ 10TEN

Plug & Play™ Solutions, S10TEN Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape Consolidation Point Housings

Description

The FutureCom™ 10TEN consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S10TEN module.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 500 MHz in compliance with class E_A and IEEE 802.3an
- S/FTP flex cable, Category 7
- High-quality RJ45 connector for 10 GbE systems
- Connector boot with latch protection

Ordering Information

Description	Length	Units per Delivery	Order Number
S10TEN consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S10TEN module and one RJ45 connector			
S/FTP flex/26-5	5 m	1/1	CCATGB-F1062-A050-C0
S/FTP flex/26-10	10 m	1/1	CCATGB-F1062-A100-C0
S/FTP flex/26-15	15 m	1/1	CCATGB-F1062-A150-C0
S/FTP flex/26-20	20 m	1/1	CCATGB-F1062-A200-C0

FutureCom™ 10TEN

Universal Test Cable

Application

The universal channel test cord can be used for acceptance tests of shielded FutureCom™ 10TEN Systems in conjunction with the universal test adapter from Fluke or other test device manufacturers.

One pair of these test cords is required for acceptance tests.

Ordering Information

Description	Length	Units per Delivery	Order Number
Universal Test Cord, for the acceptance test of the FutureCom 10TEN system in conjunction with the universal test adapter from Fluke or other test device manufacturers, 2x RJ45, 4 pairs			
grey	3 m	1/1	CCATGB-F10M0-A030-C0

5 FutureCom™ E

5.1. System Overview 104

5.2. Certificates 107

5.3. Cables

5.3.1. S/FTP 1000/23 108

5.3.2. S/FTP 800/23 110

5.3.3. S/FTP 600/23s 112

5.3.4. S/FTP 550/23 114

5.3.5. S/FTP 450/23s 116

5.3.6. F/FTP 450/23 118

5.3.7. F/UTP 450/23 120

5.4. Hardware

5.4.1. S250 Module Technology 122

5.4.2. Cat. 6 de-embedded Certificate for S250 Modules 123

5.4.3. S250 Modules and Accessories 124

5.4.4. S250 Outlets 126

5.4.5. S250 Patch Panel 128

5.5. Patch Cords 129

5.6. Plug & Play™ Solutions

5.6.1. S250 Solution Package, 1x S/FTP1000/23,2S 130

5.6.2. S250 Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 131

5.6.3. S250 Solution Package, 6x S/FTP1000/23, 2S, sewed 132

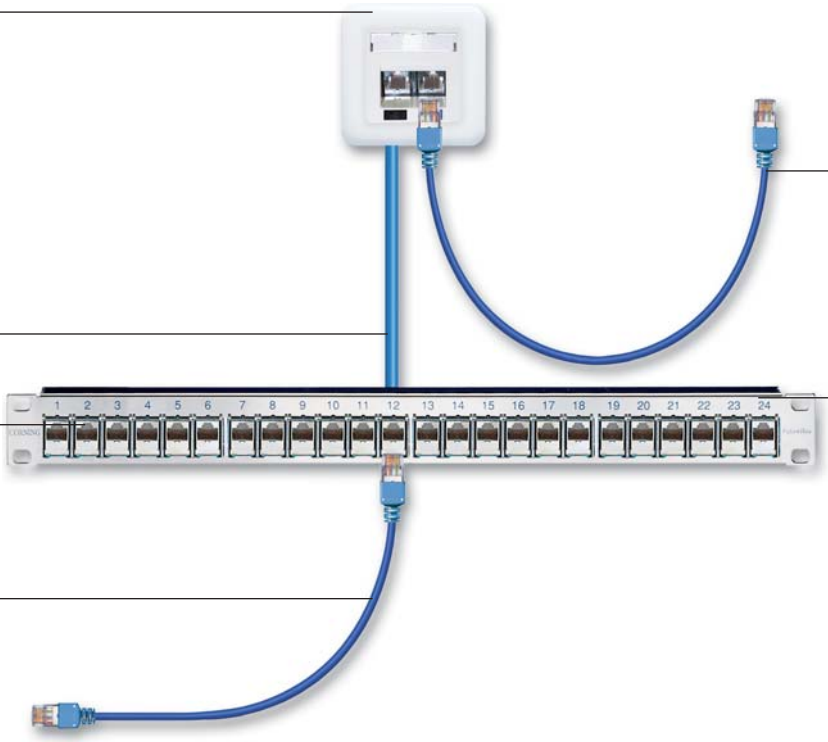
5.6.4. S250 Consolidation Point Patch Cords 133

5.7. Universal Test Cable 134

FutureCom™ E

System Overview

FutureCom™ E is Corning´s proven system solution for symmetrical cabling. It exceeds all requirements of the current ISO/IEC 11801 (2002) and EN 50173-1 (2003) standards, Class D and E links and Categories 5 and 6 for components. In addition, the FutureCom E system also satisfies Category 5e according to TIA/EIA 568-A-5.



A very high level of system performance is achieved for the link through the use of high-quality Category 6 connection technology, Category 6 and 7 cables and Category 6 patch cords. The resulting performance and the future security guarantee maximum investment protection.

Fully configured with RJ45 connectors and RJ45 modules, the cabling is application-neutral and can be used universally.

The system is suitable for all recognised standardised voice and data transmission procedures. This applies to analogue voice transmission, ISDN, Token Ring, Ethernet (10/100Base-T), Ethernet (100Base-TX) and Gigabit Ethernet (1000Base-T) and for future high bit-rate transmission procedures.

The performance of the FutureCom E cabling system has been certified by an independent testing body (see certificate). Of course, all standardised EMC threshold values in Europe are observed.

FutureCom™ E

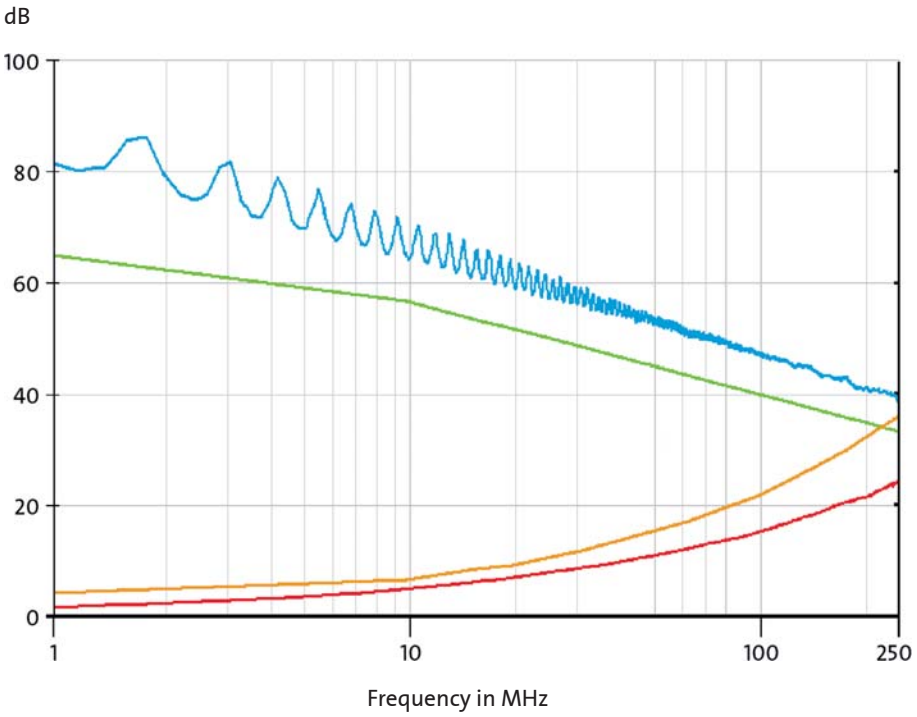
System Data for Channel Class E

Electrical characteristics (at 20°C)

Frequency [MHz]	1	10	20	62.5	100	155.5	200	250
Max. attenuation according to standard [dB]*	4	-	-	-	21.7	-	-	35.9
Typical attenuation [dB]	**2.1**	**5.5**	**8**	**12.5**	**16.5**	**20**	**24**	**27**
Min. NEXT values according to standard [dB]*	65	-	-	-	39.9	-	-	33.1
Typical NEXT values [dB]	**72.2**	**63.0**	**58.3**	**50**	**46.6**	**43.7**	**41.1**	**38.8**
Min. ACR values according to standard [dB]*	61	-	-	-	18.2	-	-	-2.8
Typical ACR values [dB]	**70.6**	**58.5**	**50.3**	**37.5**	**30**	**23.7**	**17.1**	**11.8**
Min. ELFEXT values according to standard [dB]*	63.3	-	-	-	23.3	-	-	15.3
Typical ELFEXT values [dB]	**73**	**65**	**60**	**48**	**46**	**38.8**	**35**	**33.3**
Min. return loss according to standard [dB]*	19	-	-	-	12	-	-	8
Typical return loss [dB]	**22**	**22**	**22**	**20**	**18**	**17**	**16**	**15**

* According to ISO/IEC 11801 (2002)

The system values cited only apply to the use of original FutureCom E products. Derived values, such as PSACR, PSNEXT, PSELFEXT, also comply with the standard values, but are not shown.

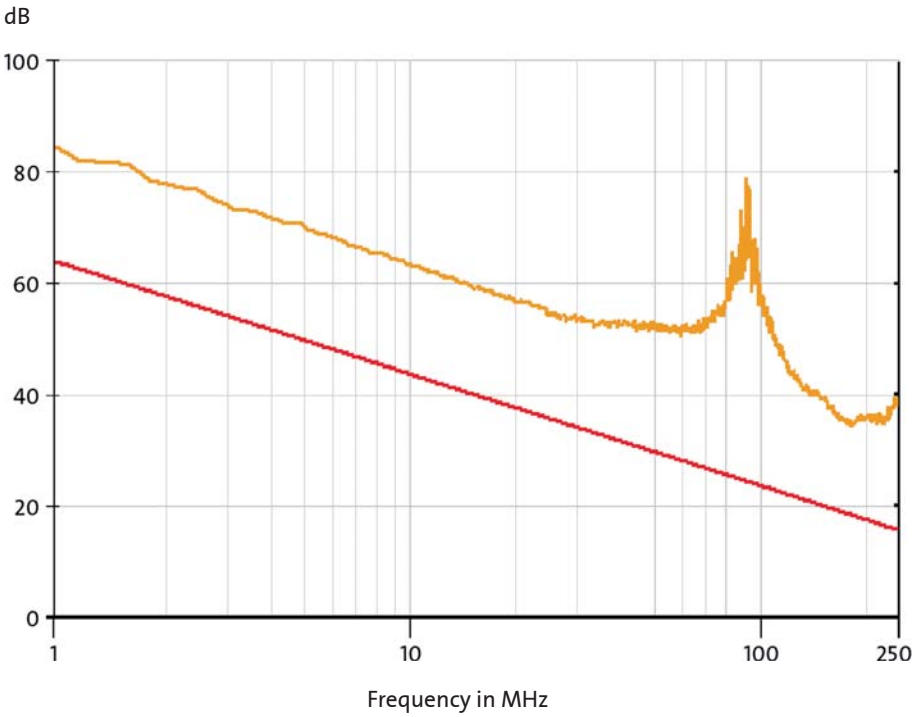


Attenuation and Near-end Crosstalk (NEXT)

- Typical NEXT values [dB]
- Min. NEXT values according to standard [dB]
- Max. attenuation according to standard [dB]
- Typical attenuation [dB]

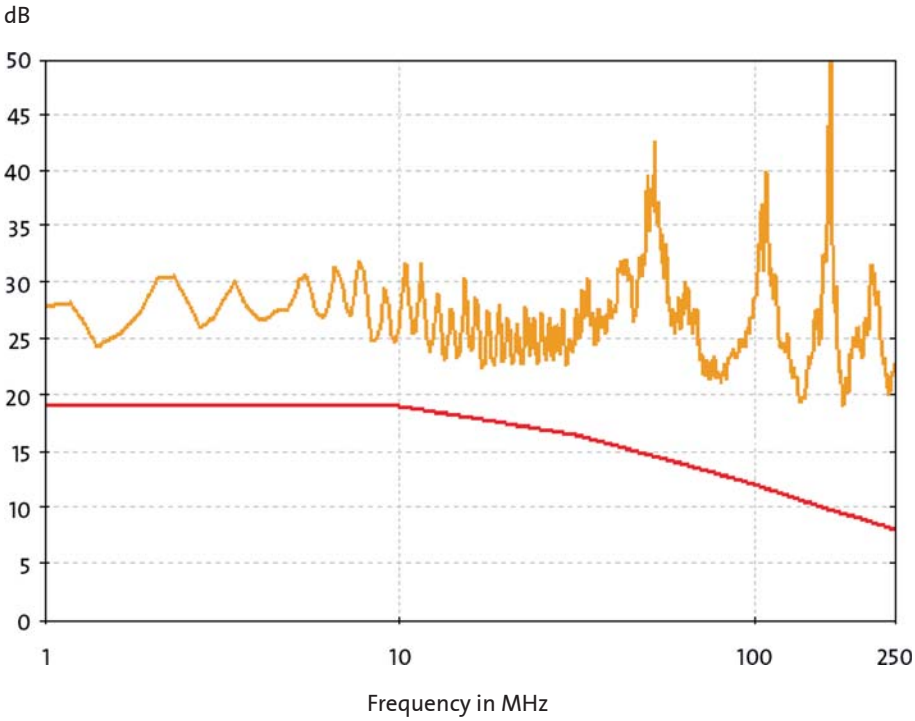
FutureCom™ E

System Data for Channel Class E



Far-end Crosstalk relating to the Far End (ELFEXT)

- Typical ELFEXT values [dB]
- Min. ELFEXT values according to standard [dB]



Return Loss

- Typical return loss [dB]
- Min. return loss according to standard [dB]

Test Setup

- FutureCom™ E test cord S/FTP flex/26, 3 m
- S250 Outlet, 2x RJ45
- 90 m FutureCom S/FTP 1000/23 cable
- S250 Patch Panel 19“
- FutureCom E test cord S/FTP flex/26, 3 m

Nominal intrinsic impedance	100 Ω
Max. DC loop resistance (according to standard)	40 Ω
DC loop resistance (typ. system values)	18 Ω
Max. delay skew (according to standard)	0.05 µs
Delay skew (typ. system values)	<0.02 µs

Certificates

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom E (3-Connector-PL)**

Data Cable 47m:	Corning FutureCom S-STP 450/23
CP Cable 23m:	Corning FutureCom CP S-STP
Patch Panel:	Corning FutureCom E S250 Modul, shielded, Cat.6
Wall Outlet:	Corning FutureCom E S250 Modul, shielded, Cat.6
CP:	Corning FutureCom E S250 Modul, RJ45-Plug, shielded, Cat.6

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

TIA/EIA-568-B.2-1 (Addendum No.1 to TIA/EIA-568-B.2) - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 6 Cabling

Results: Up to a bandwidth of **Class E**, the specimen, a **3-Connector-Permanent Link**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1180a-03-E, from 29 October 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 29 October 2003

Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom E (4-Connector-Channel)**

Data Cable: 47m and 45m	Corning FutureCom S-STP 450/23
Patch Cable: 3x 2m	Corning FutureCom S-STP flex/26
Patch Panel:	Corning FutureCom E S250 Modul, shielded, Cat.6
Wall Outlet:	Corning FutureCom E S250 Modul, shielded, Cat.6
CP:	Corning FutureCom E S250 Modul, shielded, Cat.6

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

TIA/EIA-568-B.2-1 (Addendum No.1 to TIA/EIA-568-B.2) - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 6 Cabling

Results: Up to a bandwidth of **Class E**, the specimen, a **4-Connector-Channel (98m)**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1182a-03-E, from 29 October 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 29 October 2003

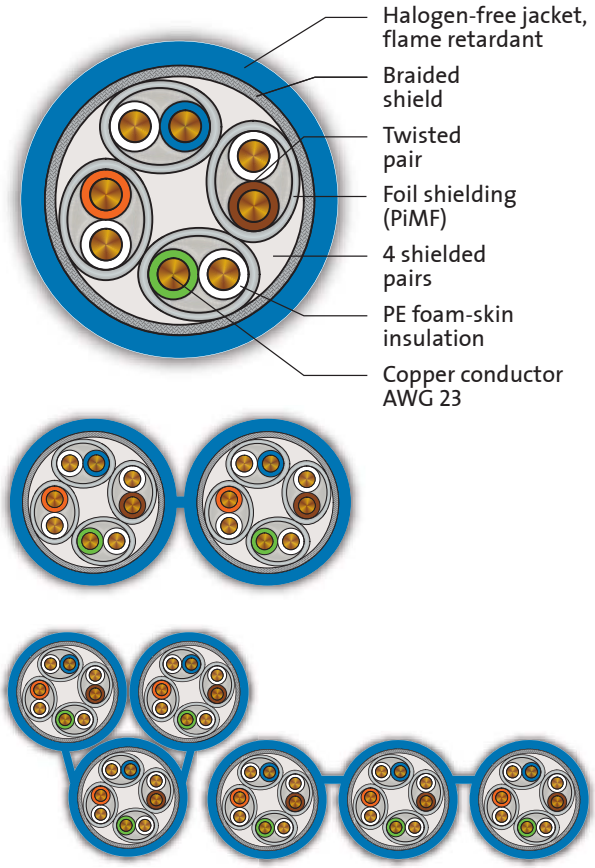
Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

FutureCom™ E

S/FTP 1000/23, Cat. 7_A Cables



Application

The FutureCom™ S/FTP 1000/23 cable is designed for applications up to 1000 MHz and tis transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 1000/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 1000/23 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**900**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.7**	**5.0**	**6.5**	**7.3**	**9.2**	**13.2**	**16.8**	**30**	**42.5**	**55**	**59**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**96**	**92**	**86**	**83**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**94**	**90**	**84**	**81**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**83.2**	**66.0**	**49.5**	**31**	**24**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

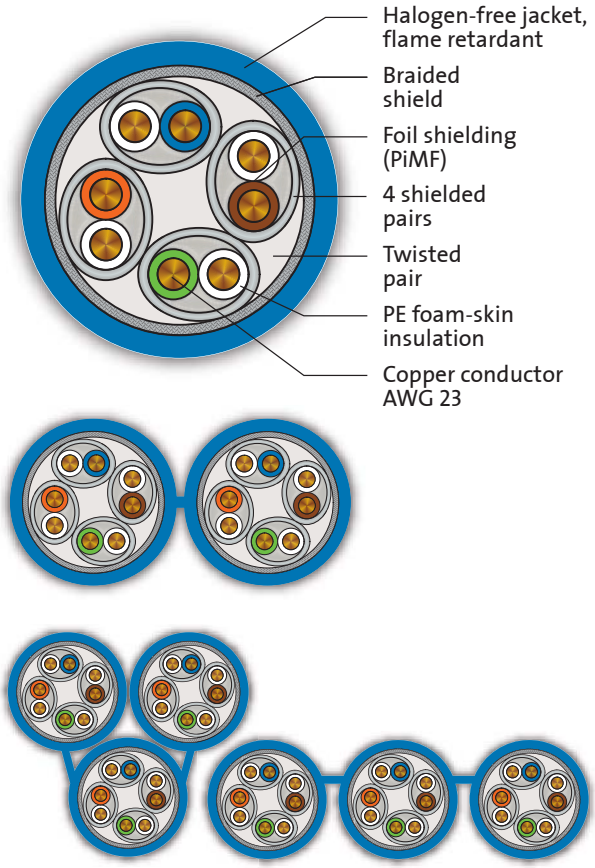
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-I0047-C001-L7**
S/FTP 1000/23 4P	7_A	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-I0047-C001-X2***
S/FTP 1000/23 8P	7_A	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-I0087-C001-L6**
S/FTP 1000/23 12P	7_A	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-I0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ E

S/FTP 800/23, Cat. 7 Cables



Application

The FutureCom™ S/FTP 800/23 cable is designed for applications up to 800 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The FutureCom S/FTP 800/23 cable is also available in a triplex version. The compact construction allows flat as well as folded installation.

Features

- S/FTP 800/23 cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Easy and convenient installation in double and triple outlets
- Compact installation of triple cable either flat or folded (only Ø16.5 mm)

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

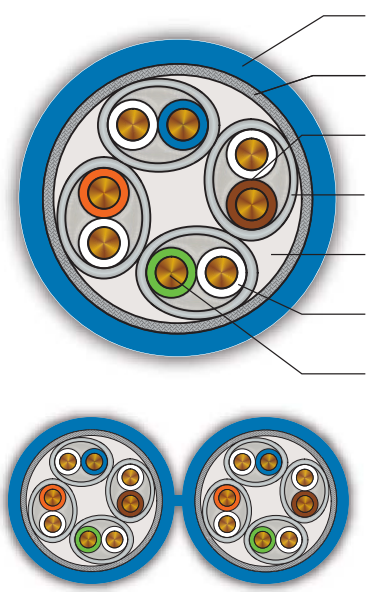
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	1000	**CCXEDB-F0047-C001-L7**
S/FTP 800/23 4P	7	4	0.62	Yes	blue	163	7.5	61	250	**CCXEDB-F0047-C001-X2***
S/FTP 800/23 8P	7	8	1.27	Yes	blue	326	7.5 x 16.0	125	500	**CCXEDB-F0087-C001-L6**
S/FTP 800/23 12P	7	12	1.92	Yes	blue	489	7.5 x 22.5	190	500	**CCXEDB-F0127-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ E

S/FTP 600/23s, Cat. 7 Cables



Application

The FutureCom™ S/FTP 600/23s cable is designed for applications up to 600 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 600/23s cable specified up to 600 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**
Attenuation according to standard [dB/100 m]*	5.7	2	7.2	8.1	10.1	14.5	18.5	33.3	48.9
Typical attenuation [dB/100 m]	**1.8**	**5.2**	**6.8**	**7.5**	**9.4**	**13.6**	**17.3**	**31.3**	**46**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**98**	**94**	**90**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8
Typical PSNEXT values [dB/100 m]	**97**	**97**	**97**	**97**	**97**	**97**	**96**	**92**	**88**
ELFEXT according to standard [dB/100 m]*	74	80	69.9	68	64.1	58.1	54.0	44.5	38.4
Typical ELFEXT values [dB/100 m]	**92**	**92**	**92**	**92**	**89**	**87**	**82**	**67**	**50**
PSELFEXT according to standard [dB/100 m]*	71	77	66.9	65	61.1	55.1	51	41.5	35.4
Typical PSELFEXT values [dB/100 m]	**90**	**90**	**90**	**90**	**87**	**83**	**80**	**65**	**48**
ACR according to standard [dB/100 m]*	74.3	78	72.8	71.9	69.5	60.6	53.9	32	11.9
Typical ACR values [dB/100 m]	**98.2**	**94.8**	**93.2**	**92.5**	**90.6**	**86.4**	**80.7**	**62.7**	**44**

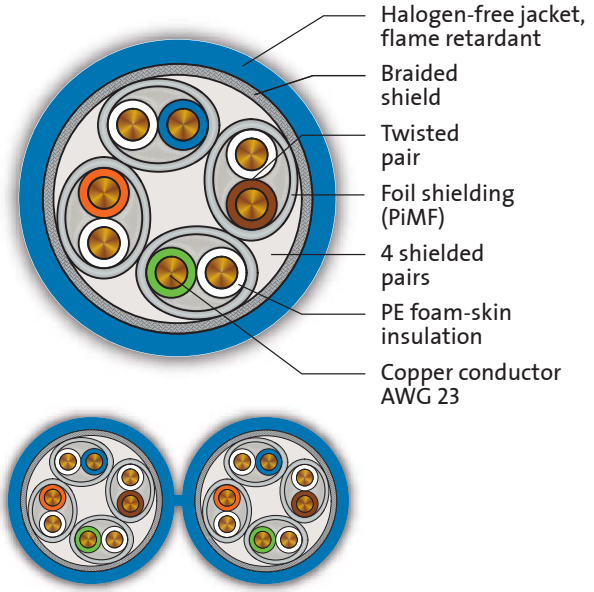
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
S/FTP 600/23s 4P	7	4	0.56	Yes	blue	163	7.3	52	1000	**CCXEDR-D0047-C001-L7**
S/FTP 600/23s 8P	7	8	1.5	Yes	blue	326	7.3 x 15.5	105	500	**CCXEDR-D0087-C001-L6**

FutureCom™ E

S/FTP 550/23, Cat. 6_A Cables



Application

The FutureCom™ S/FTP 550/23 cable is designed for applications up to 550 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1 and IEC 61156-5

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 550/23 cable specified up to 550 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**550**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	6	10.8	15.5	19.9	33	-
Typical attenuation [dB/100 m]	**1.8**	**5.3**	**6.8**	**7.6**	**9.6**	**13.6**	**17.3**	**27.7**	**42.6**
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	59.3	51.9	47.4	44.3	3.3	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**97**	**95**	**90.0**	**77.2**
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	57.3	49.9	45.4	42.3	36	-
Typical PSNEXT values [dB/100 m]	**98.0**	**98**	**98**	**98**	**98**	**95**	**93**	**88**	**75.2**
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	50	40.1	34.1	30	3	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**70**	**50.8**
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	47	37.1	31.1	27	22	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**68**	**48.8**
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	53.3	41.1	31.9	24.4	5.3	-
Typical ACR values [dB/100 m]	**98.2**	**94.7**	**93.2**	**92.4**	**90.4**	**83.4**	**77.7**	**62.3**	**34.6**

* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

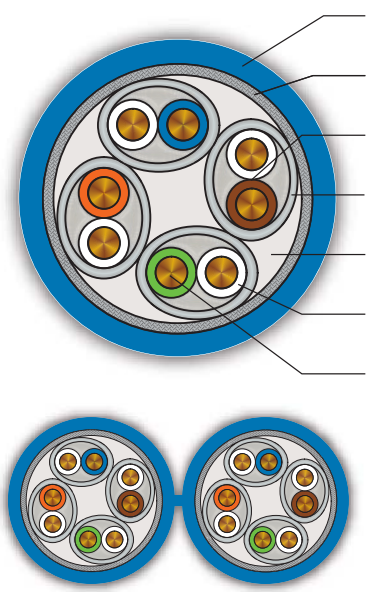
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	1000	**CCXEDB-D0047-C001-L7**
S/FTP 550/23 4P	6_A	4	0.57	Yes	blue	145	7.2	56	250	**CCXEDB-D0047-C001-X2***
S/FTP 550/23 8P	6_A	8	1.16	Yes	blue	290	7.2 x 15.5	113	500	**CCXEDB-D0087-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ E

S/FTP 450/23s, Cat. 6 Cables



Application

The FutureCom™ S/FTP 450/23s cable is designed for applications up to 450 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this copper data cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 450/23s cable specified up to 450 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥21 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**450**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	8.5	10.8	15.5	19.9	33	-
Typical attenuation [dB/100 m]	**1.8**	**5.4**	**6.9**	**7.8**	**9.8**	**13.9**	**17.7**	**28.2**	**38.6**
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	54.8	51.9	47.4	44.3	3.3	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**96**	**94**	**89**	**82.7**
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	52.8	49.9	45.4	42.3	36	-
Typical PSNEXT values [dB/100 m]	**98.0**	**98.0**	**98.0**	**98.0**	**98.0**	**94**	**92**	**87**	**80.7**
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	44	40.1	34.1	30	3	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**85**	**82**	**69**	**58.3**
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	41	37.1	31.1	27	22	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**83**	**80**	**67**	**56.3**
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	46.3	41.1	31.9	24.4	5.3	-
Typical ACR values [dB/100 m]	**98.2**	**94.6**	**93.1**	**92.2**	**90.2**	**82.1**	**76.3**	**60.8**	**44.1**

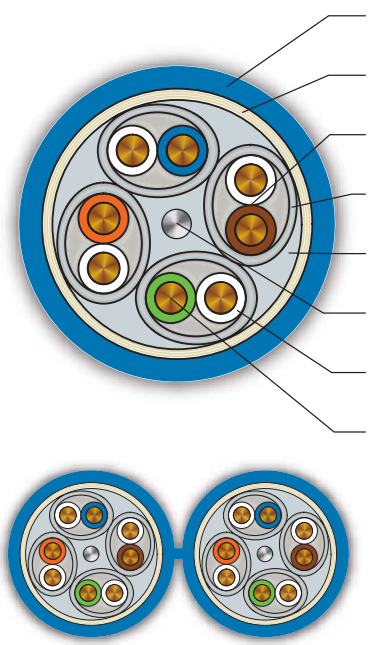
* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 450/23s 4P	6	4	0.5	Yes	blue	120	7.0	48	1000	**CCXEDR-D0047-C002-L7**
S/FTP 450/23s 8P	6	8	1.03	Yes	blue	240	7.0 x 15.5	96	500	**CCXEDR-D0087-C002-L6**

FutureCom™ E

F/FTP 450/23, Cat. 6 Cables



Application

The FutureCom™ F/FTP 450/23 cable is designed for applications up to 450 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1, IEC 61156-5 and TIA/EIA 568.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this copper data cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

Each pair is individually foil shielded, which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- F/FTP 450/23 cable specified up to 450 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥22 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	2 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<100 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.3 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**450**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	8.5	10.8	15.5	19.9	33	-
Typical attenuation [dB/100 m]	**1.8**	**5.3**	**6.8**	**7.6**	**9.6**	**13.6**	**17.3**	**27.7**	**38**
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	54.8	51.9	47.4	44.3	3.3	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**97**	**95**	**90**	**85**
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	52.8	49.9	45.4	42.3	36	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98.0**	**98.0**	**98.0**	**95**	**93**	**88**	**83**
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	44	40.1	34.1	30	3	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**70**	**54**
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	41	37.1	31.1	27	22	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**68**	**52**
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	46.3	41.1	31.9	24.4	5.3	-
Typical ACR values [dB/100 m]	**98.2**	**94.7**	**93.2**	**92.4**	**90.4**	**83.4**	**77.7**	**62.3**	**47**

* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

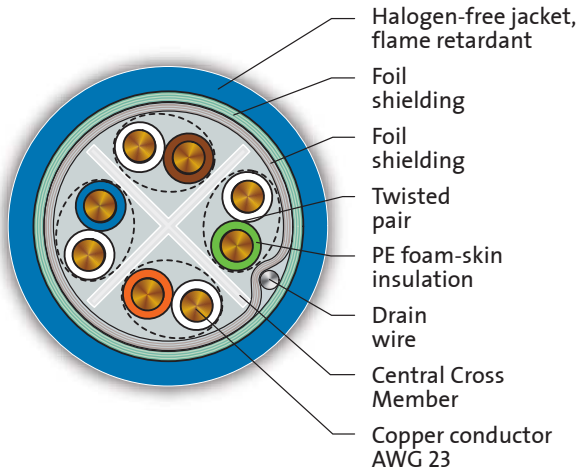
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
F/FTP 450/23 4P	6	4	0.57	Yes	blue	101	7.2	48	1000	**CCXDDA-D0047-C001-L7**
F/FTP 450/23 4P	6	4	0.57	Yes	blue	101	7.2	48	250	**CCXDDA-D0047-C001-X2***
F/FTP 450/23 8P	6	8	1.16	Yes	blue	202	7.2 x 15.5	97	500	**CCXDDA-D0087-C001-L6**

* X2 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ E

F/UTP 450/23, Cat. 6 Cables



Application

The FutureCom™ F/UTP 450/23 cable is designed for applications up to 450 MHz and its transmission characteristics exceed Category 6 specifications according to EN 50288-5-1, IEC 61156-5 and TIA/EIA 568.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this copper data cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are foil shielded (F/UTP). The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- F/UTP 450/23 cable specified up to 450 MHz
- Outstanding electrical characteristics
- Double foil shielding and additional copper wire
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥20 mm
Min. bending radius during installation	≥60 mm
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<100 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.67 * c
Propagation delay ≥10 MHz	5.0 ns/m
Delay skew	30 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**
Attenuation according to standard [dB/100 m]*	2.1	6	7.6	8.5	10.8	15.5	19.9	33
NEXT according to standard [dB/100 m]*	66.0	59.3	56.2	54.8	51.9	47.4	44.3	3.3
PSNEXT according to standard [dB/100 m]*	64.0	57.3	54.2	52.8	49.9	45.4	42.3	36
ELFEXT according to standard [dB/100 m]*	66.0	50	45.9	44	40.1	34.1	30	3
PSELFEXT according to standard [dB/100 m]*	64.0	47	43	41	37.1	31.1	27	22
ACR according to standard [dB/100 m]*	63.9	53.3	48.6	46.3	41.1	31.9	24.4	5.3

* Standard: Requirements on 100 m of installed Category 6 cable for Class E/E_A cabling sections (conforms with EN 50288-5-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
F/UTP 450/23 4P	6	4	0.76	Yes	blue	104	6.7	49	1000	**CCXCDE-B0047-C001-L7**

FutureCom™ E

S250 Module Technology

Features

- Fully compatible with all modular LANscape® systems
- Wide range of installation options
- Few individual components
- High-level component density
- Individual shielding
- Halogen-free
- Flame retardant, fire Class UL94 V-0

Individual components of the S250 Module

FutureCom S250 Technology

- Optimised construction with printed circuit board for bandwith of more than 300 MHz
- More than 1500 connector cycles possible
- Proven IDC technology for wires with AWG 24 to AWG 22
- Module reusable several times

Disassembled S250 Basic Module

Application

- Wire management using TIA/EIA 568 A/B coding
- Installation in pairs (no untwisting of pairs necessary)
- Rapid assembly time
- Easy handling
- Compatible with all FutureCom S/FTP, F/FTP and F/UTP cables

S250 Wire Management

Cat. 6 de-embedded Certificate for S250 Modules

Zertifikat

Auftraggeber:

Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Prüfling:

Corning FutureCom
Basismodul S/U250 Kat6 RJ45
Sach-Nr.: C45104 A30 B210

enthalten in der **S250-Produktfamilie**

Bewertungsstandards:

ISO/IEC 11801:2002-09
Information technology – Generic cabling for customer premises

EN 50173-1: 2003
Information technology – Generic cabling systems Part 1

IEC 60603-7-5 / Ed. 1.0 (ACDV 09.2003): Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for Data transmissions with frequencies up to 250 MHz (Cat 6, shielded) - 2003

TIA/EIA-568-B.2-1 (Addendum No.1 to TIA/EIA-568-B.2) - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 6 Cabling

Resultat:

Der Prüfling hält bei den im Prüfbericht genannten Prüfparametern die Grenzwerte der besagten Vorgabedokumente ein.
Die bei der Prüfung ermittelten Ergebnisse beziehen sich auf den beschriebenen und vom Auftraggeber vorgelegten Prüfling. Zukünftige technische Änderungen der Komponente unterliegen dem Verantwortungsbereich der Hersteller.

Dieses Zertifikat verweist auf den ausführlichen Prüfbericht **PB-Nr. P1167a-03-D vom 26. September 2003** und ist nur in Verbindung mit diesem gültig.

Bexbach, 26. September 2003

Dipl.-Ing. Frank Streibert
(Vorstand)

CAT. 6 (IEC) DE-EMBEDDED TESTED

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

FutureCom™ E

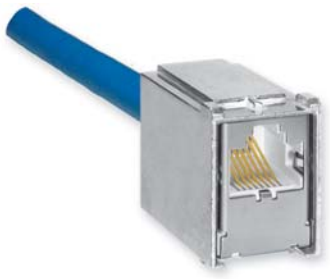
S250 Modules and Accessories

Features

- Quick and easy to install
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- High density
- Universal application in all modular LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules
- Category 6 (2002), de-embeded

S250 Modules

Description	Units per Delivery	Order Number
S250 Module, 1x RJ45, shielded, Cat. 6, incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
white	1/1	CAXESM-00100-C001



Description	Units per Delivery	Order Number
S250 Double Module, 2x RJ45, shielded, Cat. 6, incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
white	1/1	CAXESM-00200-C001

S250 Modules and Accessories

Cable Strain Relief

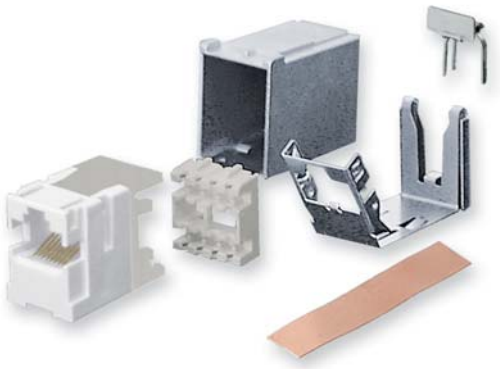
- Using the additional cable strain relief allows increased pulling force on the module housings

Description	Units per Delivery	Order Number
Additional cable strain relief, for higher pulling force on shielded FutureCom™ modules for solid wire, and for assembly of flexible consolidation point cables with FutureCom S10^{TENfx} or S250^{fx} modules		
silver	100/1	CAXCSN-00000-C001

S250^{fx} Module

Description

S250^{fx} modules have to be assembled according to TIA/EIA 568 B when using Corning patch cords, in other case single-side terminated third party patch cords have to be installed like the RJ45 connector assignment. Assembling the module with flex cables the cable strain relief is recommended.



Features

- Quick and easy to install
- No special tools required
- High density
- Universal application in all modular LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules
- Category 6 (2002), de-embeded

Description	Units per Delivery	Order Number
S250^{fx} Module, 1x RJ45, shielded, Cat. 6, suitable for consolidation point cable with AWG 26 up to AWG 24 flex cables, incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
white, wire management grey	1/1	CAXESM-00100-C004

FutureCom™ E

S250 Outlets

Application

The FutureCom™ S250 inclined outlet is suitable for transmission of digital data signals for conventional applications in compliance with ISO/IEC 11801 (2002) and EN 50173-1 (2003). The outlet is also suitable for PoE applications in compliance with IEEE 802.3af (2003).

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets. The individual single shielding of the modules (in compliance to EN 50174) is absolutely necessary for these high bit rate applications.

Features

- Suitable for ISO 55-65 raceway, surface, flush or floor box mounting
- Stable galvanised frame with compact design and small dimensions
- No special tools required
- Single shielding of modules by sturdy die cast metal housing
- recyclable
- Transmission characteristics in compliance with IEC 11801 (2002), EN 50173-1 (2003), IEEE 802.3an and IEEE 802.3af (2003) Power over Ethernet

Description	Units per Delivery	Order Number
S250 Outlet, 2x RJ45, Cat. 6, shielded, inclined, incl. mounting frame with grounding flaps, central plate 50 x 50 mm with designation window, screw fixing, copper conducting tape (without faceplate)		
white, RAL 9010	1/1	CAXESD-S0201-C001
pearl white, RAL 1013	1/1	CAXESD-S0202-C001

FutureCom™ E

S250 Outlets

Application

The FutureCom™ S250 double outlet is suitable for transmission of digital data signals for conventional applications in compliance with ISO/IEC 11801 (2002) and EN 50173-1 (2003). The outlet is also suitable for PoE applications in compliance with IEEE 802.3af (2003).

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets.

Features

- Suitable for Rutenbeck compatible central plates
- Suitable for ISO 55-65 raceway, surface, flush or floor box mounting
- Stable galvanised frame with compact design and small dimensions
- No special tools required
- recyclable
- Transmission characteristics in compliance with IEC 11801 (2002), EN 50173-1 (2003), IEEE 802.3an and IEEE 802.3af (2003) Power over Ethernet

Description	Units per Delivery	Order Number
S250 Double Outlet, 2x RJ45, Cat. 6, shielded, inclined, incl. mounting frame with grounding flaps, screw fixing, copper conducting tape (suitable for Rutenbeck compatible central plates)		
silver	1/1	CAXESD-S0200-C001

Installation variant

Bill of materials

- S250 double outlet

  1 x CAXESD-S0200-C001

Assembled with Jung high-grade steel face plate

FutureCom™ E

S250 Patch Panel

Features

- Easy and quick installation of system modules
- Recyclable, high-grade steel, stainless
- Two standardised grounding latches
- Integrated cable strain relief for optimal strain relief of each cable
- For Patch Panel accessories see page 209

S250 Patch Panel 19“, incl. 24 S250 modules

Description	Units per Delivery	Order Number
S250 Patch Panel 19“, shielded, Cat. 6, including 24 FutureCom™ S250 modules and copper conducting tape, with integrated cable strain relief, 1 U, high-grade steel front panel		
high-grade steel	1/1	CAXESV-02400-C001

FutureCom™ E

Patch Cords, RJ45 - RJ45

Description

The application-neutral FutureCom™ E patch cords have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with a shielded RJ45 connector on each end.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- S/FTP flex cable, Category 7
- Application-neutral due to using all four pairs of RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class E (2002) link specification
- Category 6

Ordering Information

Length	grey	blue	yellow	green	red	black
0.5 m	CCAEGB-G1002-A005-C0	on request	on request	on request	on request	on request
1 m	CCAEGB-G1002-A010-C0	CCAEGB-G2002-A010-C0	CCAEGB-G3002-A010-C0	CCAEGB-G4002-A010-C0	CCAEGB-G5002-A010-C0	CCAEGB-G6002-A010-C0
2 m	CCAEGB-G1002-A020-C0	CCAEGB-G2002-A020-C0	CCAEGB-G3002-A020-C0	CCAEGB-G4002-A020-C0	CCAEGB-G5002-A020-C0	CCAEGB-G6002-A020-C0
3 m	CCAEGB-G1002-A030-C0	CCAEGB-G2002-A030-C0	CCAEGB-G3002-A030-C0	CCAEGB-G4002-A030-C0	CCAEGB-G5002-A030-C0	CCAEGB-G6002-A030-C0
5 m	CCAEGB-G1002-A050-C0	CCAEGB-G2002-A050-C0	CCAEGB-G3002-A050-C0	CCAEGB-G4002-A050-C0	CCAEGB-G5002-A050-C0	CCAEGB-G6002-A050-C0
10 m	CCAEGB-G1002-A100-C0	CCAEGB-G2002-A100-C0	CCAEGB-G3002-A100-C0	CCAEGB-G4002-A100-C0	CCAEGB-G5002-A100-C0	CCAEGB-G6002-A100-C0

Other lengths upon request

FutureCom™ E

Plug & Play™ Solutions, S250 - S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S250 Plug & Play Solution Packages are factory pre-terminated cables with S250 modules at each end. They are generally offered with FutureCom S/FTP 1000/23 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Solution Package, S/FTP1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S250 modules			
S/FTP 1000/23-10	10 m	1/1	CCAEDB-D2050-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCAEDB-D2050-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCAEDB-D2050-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCAEDB-D2050-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCAEDB-D2050-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCAEDB-D2050-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCAEDB-D2050-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCAEDB-D2050-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCAEDB-D2050-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCAEDB-D2050-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCAEDB-D2050-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCAEDB-D2050-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCAEDB-D2050-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCAEDB-D2050-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCAEDB-D2050-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCAEDB-D2050-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCAEDB-D2050-A900-C0

FutureCom™ E

Plug & Play™ Solutions, 6x S250 - 6x S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S250 Plug & Play Solution Packages are specified up to 250 MHz and provide outstanding performance for the transmission of digital data signals for 1GbE in compliance with Class E according to ISO/IEC 11801.
This special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S250 modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S250 modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCAEDB-D2650-A100-C0
6x S/FTP 1000/23-20	20 m	1/1	CCAEDB-D2650-A200-C0
6x S/FTP 1000/23-30	30 m	1/1	CCAEDB-D2650-A300-C0
6x S/FTP 1000/23-40	40 m	1/1	CCAEDB-D2650-A400-C0

FutureCom™ E

Plug & Play™ Solutions, 6x S250 - 6x S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S250 Plug & Play Solution Packages are specified up to 250 MHz and provide outstanding performance for the transmission of digital data signals for 1GbE in compliance with Class E according to ISO/IEC 11801.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S250 modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S250 modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCAEDB-D2650-A100-EN
6x S/FTP 1000/23-20	20 m	1/1	CCAEDB-D2650-A200-EN
6x S/FTP 1000/23-30	30 m	1/1	CCAEDB-D2650-A300-EN
6x S/FTP 1000/23-40	40 m	1/1	CCAEDB-D2650-A400-EN

FutureCom™ E

Plug & Play™ Solutions, S250 Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ E consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S250 module. The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 250 MHz in compliance with Class E
- S/FTP flex cable, Category 7

Ordering Information

Description	Length	Units per Delivery	Order Number
FutureCom E consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S250 module and one RJ45 connector			
S/FTP flex/26-5	5 m	1/1	CCAEGB-D1052-A050-C0
S/FTP flex/26-10	10 m	1/1	CCAEGB-D1052-A100-C0
S/FTP flex/26-15	15 m	1/1	CCAEGB-D1052-A150-C0
S/FTP flex/26-20	20 m	1/1	CCAEGB-D1052-A200-C0

FutureCom™ E

Universal Test Cable

Application

The universal channel test cord can be used for acceptance tests of shielded FutureCom™ E Systems in conjunction with the universal test adapter from Fluke or other test device manufacturers.

One pair of these test cords is required for acceptance tests.

Ordering Information

Description	Length	Units per Delivery	Order Number
Universal Test Cord, for the acceptance test of the FutureCom E system in conjunction with the universal test adapter from Fluke or other test device manufacturers, 2xRJ45, 4 pairs			
grey	3 m	1/1	CCAEGB-D10M0-A030-C0

6 FutureCom™ D

6.1. System Overview 136

6.2. Certificates 139

6.3. Cables

6.3.1. SF/UTP 300/24 FRNC 140

6.3.2. SF/UTP 300/24 16P 142

6.3.3. SF/UTP 300/24 PVC 144

6.3.4. SF/UTP 300/24s FRNC 146

6.3.5. F/UTP 300/24 FRNC 148

6.3.6. F/UTP 300/24 PVC 150

6.4. Hardware

6.4.1. S100^{e} and S100^{eL} Module Technology 151

6.4.2. S100^{e} and S100^{eL} Modules 152

6.4.3. S100^{e} Outlets and Patch Panel 154

6.4.4. S100^{eL} Outlets and Patch Panel 156

6.5. Patch Cords

6.5.1. Cat. 5 Patch Cords, 2x RJ45 157

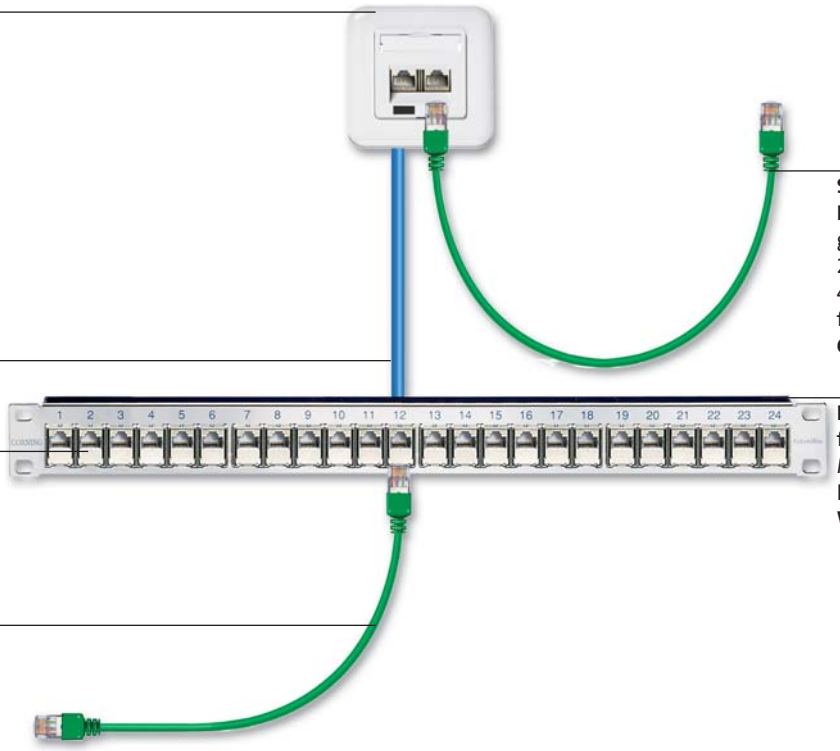
6.5.2. Cat. 5 Patch Cords, 2x RJ45, crossed 158

6.6. Plug & Play™ Solutions 159

FutureCom™ D

System Overview

FutureCom™ D (2002) is Corning 's Class D system solution for symmetrical cabling. It fulfils all requirements of the current ISO/IEC 11801 (2002) and EN 50173-1 (2003) standards, Class D for links and Category 5 for the components. In addition, the FutureCom D system also satisfies Category 5e according to TIA/EIA-568-B.2.



Face Plate
„DELTAprofil“,
80 x 80 mm
WAXWSE-00000-C001
and **S100ᵉ Outlet**,
2x RJ45, inclined,
Cat.5/5e
CAXDSD-S0201-C001

SF/UTP flex/26
Patch Cord,
green, 2 m,
2x RJ45 connector,
4 pairs,
for 10/100/1000 BASE-T
CCADGF-D4002-A020-C0

FutureCom
SF/UTP 300/24
CCXDEF-C047-C001-L7

S100ᵉ Module,
1x RJ45, shielded,
Cat. 5/5e,
CAXDSM-00100-C001

Patch Panel 19“,
for up to 24 LANscape
Modules, 1 U,
high-grade steel
WAXWSV-02400-C001

SF/UTP flex/26
Patch Cord,
green, 3 m,
2x RJ45 connector,
4 pairs,
for 10/100/1000 BASE-T
CCADGF-D4002-A030-C0

A high level of system performance is achieved for the entire link through the use of high-quality Category 5 connection technology, cables and patch cords.
The resulting performance, and future security, guarantees a high degree of investment protection for the cabling.

Fully configured with RJ45 connectors and RJ45 modules, the cabling is application-neutral and can be used universally.

FutureCom D cabling that conforms to the standards is suitable for all recognised standardised voice and data transmission procedures. This applies to analogue voice transmission, ISDN, Token Ring, Ethernet (10-Base-T), Ethernet (100Base-TX) and Gigabit Ethernet (1000Base-T).

The performance of the FutureCom D cabling system has been certified by an independent test body (see certificate). Of course, all standardised EMC threshold values in Europe are observed.

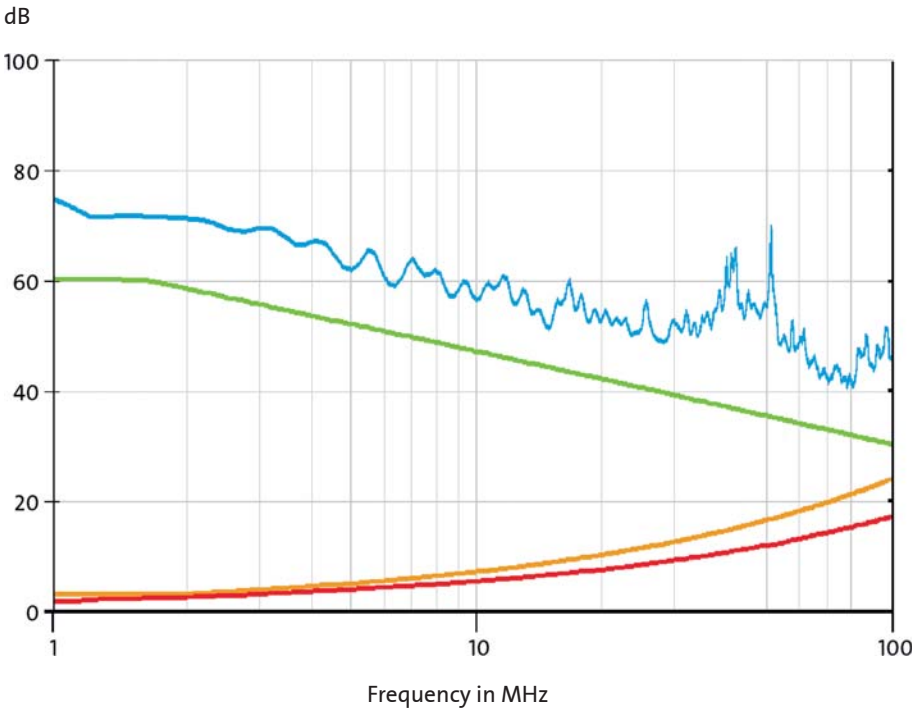
System Data for Channel Class D

Electrical characteristics (at 20°C)

Frequency [MHz]	1	4	10	16	20	31.25	62.5	100
Max. attenuation according to standard [dB]*	4	-	-	9.1	-	-	-	24
Typical attenuation [dB]	**2.3**	**3.5**	**5.8**	**7**	**8.5**	**10**	**16**	**19**
Min. NEXT values according to standard [dB]*	60	-	-	43.6	-	-	-	30.1
Typical NEXT values [dB]	**70**	**60**	**55**	**51**	**48**	**44**	**38**	**36**
Min. ACR values according to standard [dB]*	56	-	-	34.5	-	-	-	6.1
Typical ACR values [dB]	**67.7**	**56.5**	**49.2**	**44**	**39.2**	**34**	**22**	**17**
Min. ELFEXT values according to standard [dB]*	57.4	-	-	33.3	-	-	-	17.4
Typical ELFEXT values [dB]	**70**	**60**	**52**	**48**	**46.0**	**43**	**38**	**34**
Min. return loss according to standard [dB]*	17	-	-	17	-	-	-	10
Typical return loss [dB]	**19**	**20**	**20**	**20**	**19.5**	**19**	**17**	**13**

* According to ISO/IEC 11801 (2002)

The system values cited only apply to the use of original FutureCom D products. Derived values, such as PSACR, PSNEXT, PSELFEXT, also comply with the standard values, but are not shown.

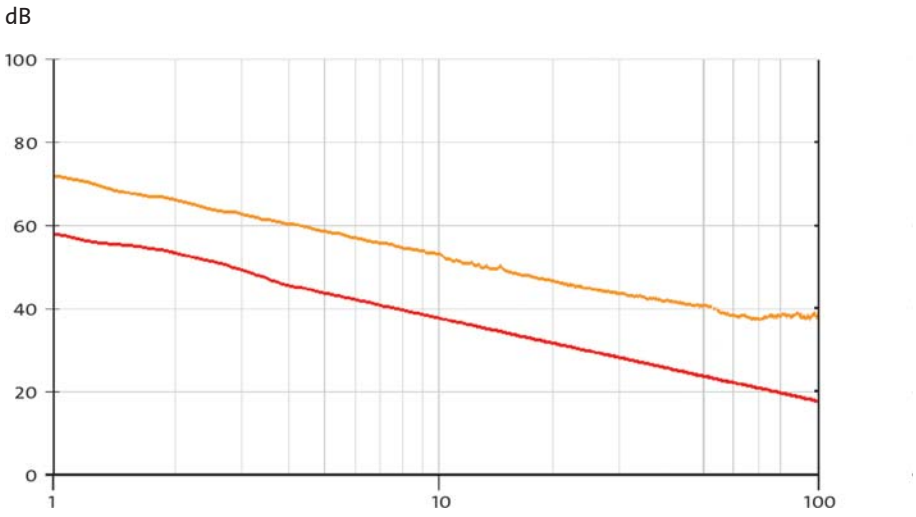


Attenuation and Near-end Crosstalk (NEXT)

- Typical NEXT values [dB]
- Min. NEXT values according to standard [dB]
- Typical attenuation [dB]
- Max. attenuation according to standard [dB]

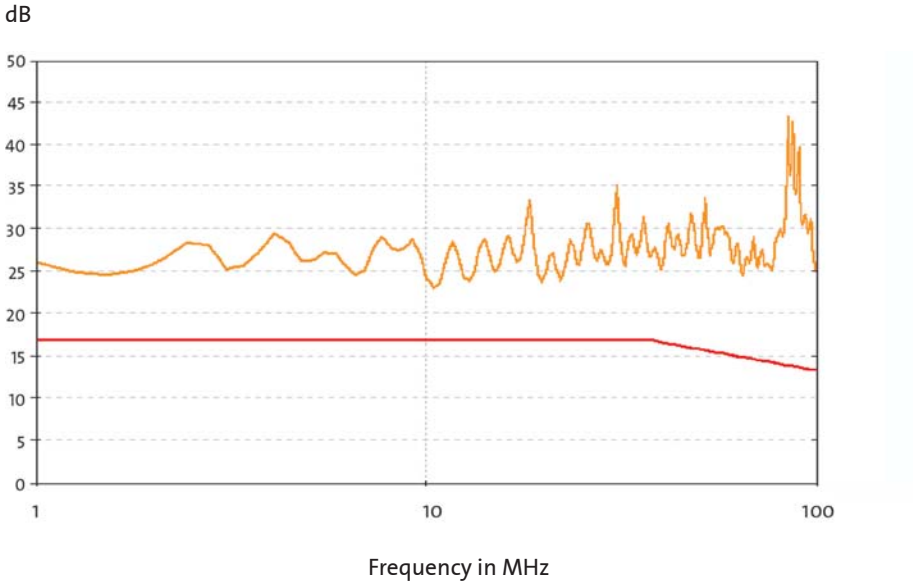
FutureCom™ D

System Data for Channel Class D



Far-end Crosstalk relating to the Far End (ELFEXT)

- Typical ELFEXT values [dB]
- Min. ELFEXT values according to standard [dB]



Return Loss

- Typical return loss [dB]
- Min. return loss according to standard [dB]

Test Setup

- FutureCom™ D test cord SF/UTP flex/26, 3 m
- S100[e] Outlet, 2x RJ45
- 90 m FutureCom SF/UTP 300/24 cable
- S100[e] Patch Panel 19“
- FutureCom D test cord SF/UTP flex/26, 3 m

Nominal intrinsic impedance	100 Ω
Max. DC loop resistance (according to standard)	40 Ω
DC loop resistance (typ. system values)	18 Ω
Max. delay skew (according to standard)	0.05 µs
Delay skew (typ. system values)	<0.02 µs

Certificates

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom D (3-Connector-PL)**

Data Cable 49m:	Corning FutureCom FTP 300/24 Cat.5
CP Cable 31m:	Corning FutureCom S-FTP flex/26 Cat.5
Patch Panel:	Corning FutureCom D S100e Modul, shielded, Cat.5
Wall Outlet:	Corning FutureCom D S100e Modul, shielded, Cat.5
CP:	Corning FutureCom D S100e Modul, RJ45-Plug, shielded, Cat.5

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

TIA/EIA-568-B.2 - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 5 Cabling

Results: Up to a bandwidth of **Class D**, the specimen, a **3-Connector-Permanent Link**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1183a-03-E, from 31 October 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 31 October 2003

Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

Certificate

Customer: Corning Cable Systems GmbH & Co. KG
Austraße 101
D-96465 Neustadt/Coburg

Description: **Corning FutureCom D (4-Connector-Channel)**

Data Cable: 49m and 40m	Corning FutureCom FTP 300/24 Cat.5
Patch Cable: 2x 5m, 1x 3m	Corning FutureCom S-FTP flex/26 Cat.5
Patch Panel:	Corning FutureCom D S100e Modul, shielded, Cat.5
Wall Outlet:	Corning FutureCom D S100e Modul, shielded, Cat.5
CP:	Corning FutureCom D S100e Modul, shielded, Cat.5

Applied standards: ISO/IEC 11801: 2002
Information technology – Cabling for customer premises.

EN 50173-1: 2003
Information technology – Generic cabling systems –
Part 1: General requirements and office areas

TIA/EIA-568-B.2-1 (Addendum No.1 to TIA/EIA-568-B.2) - June 2002
Transmission Performance Specifications for 4-Pair 100Ω Category 6 Cabling

Results: Up to a bandwidth of **Class D**, the specimen, a **4-Connector-Channel**, meet the limits of the specified standards and regulations.

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the data cables or connectors are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report, **no. P1184a-03-E, from 31 October 2003** and shall only be applicable in conjunction with the test report.

Bexbach, 31 October 2003

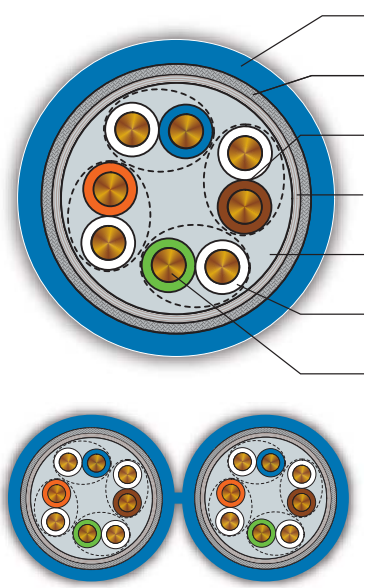
Frank Streibert, engineer
(board of management)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Tel.: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
E-Mail: info@ghmt.de
http://www.ghmt.de

GHMT Aktiengesellschaft

FutureCom™ D

SF/UTP 300/24 FRNC, Cat. 5 Cables



Application

The FutureCom™ SF/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- SF/UTP 300/24 cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Full shielding with foil shield and additional braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

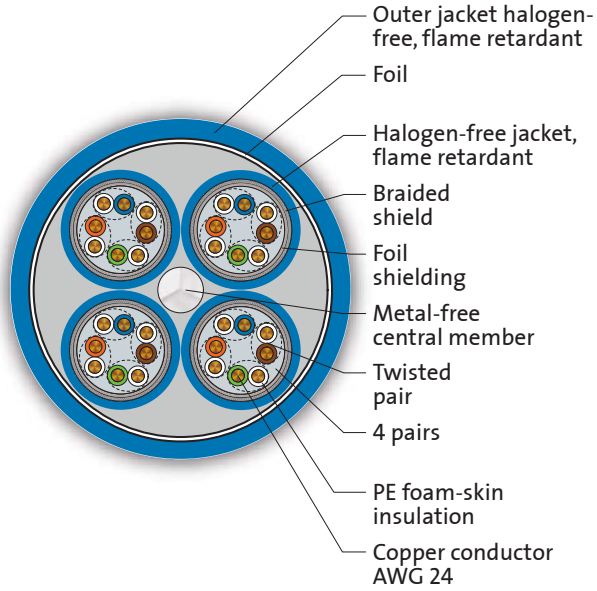
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
SF/UTP 300/24 4P	5_e	4	0.46	Yes	blue	137	6.1	50	1000	**CCXDEF-C0047-C001-L7**
SF/UTP 300/24 4P	5_e	4	0.46	Yes	blue	137	6.1	50	305	**CCXDEF-C0047-C001-X1**
SF/UTP 300/24 8P	5_e	8	0.96	Yes	blue	274	6.2 x 13.5	100	1000	**CCXDEF-C0087-C001-L7**

* X1 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ D

SF/UTP 300/24 16P , Cat. 5 Cables



Application

The FutureCom™ SF/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this copper data cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

The quattro configuration with a shared external sheath for the FutureCom SF/UTP 300/24 16P cable allows increased mechanical load and enables cost-optimised installation.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- SF/UTP 300/24 cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Full shielding with foil shield and additional braid shield
- 4 cable cores twisted around a non-metellic central element
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥85 mm
Min. bending radius during installation	≥120 mm
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

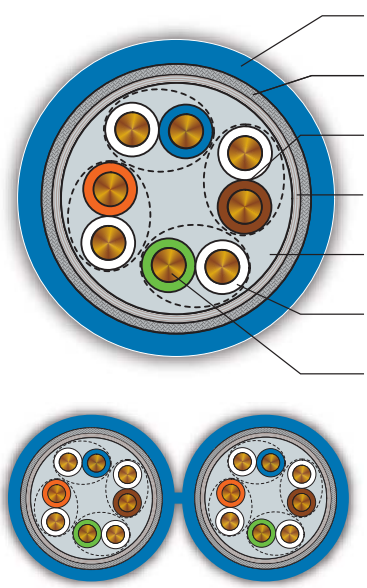
* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
SF/UTP 300/24 16P	5_e	16	4.04	Yes	blue	397	16.5	280	1000	**CCXDEF-C0167-C001-L7**

FutureCom™ D

SF/UTP 300/24 PVC, Cat. 5 Cables



Application

The FutureCom™ SF/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this copper data cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- SF/UTP 300/24 cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Full shielding with foil shield and additional braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	PVC, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

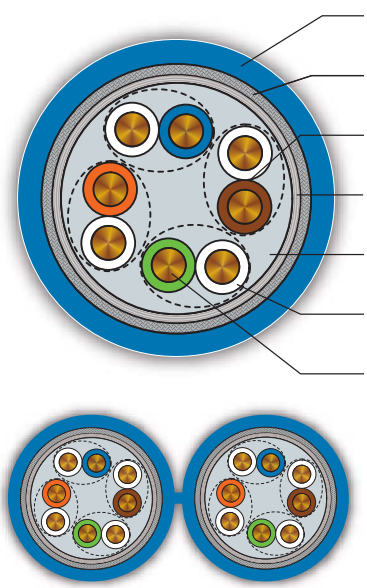
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
SF/UTP 300/24 4P	5_e	4	0.40	Yes	blue	137	5.8	45	1000	**CCXDLF-C0047-C001-L7**
SF/UTP 300/24 4P	5_e	4	0.40	Yes	blue	137	5.8	45	305	**CCXDLF-C0047-C001-X1**
SF/UTP 300/24 8P	5_e	8	0.94	No	blue	274	6.2 x 13.5	97	1000	**CCXDLF-C0087-C001-L7**

* X1 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ D

SF/UTP 300/24s FRNC, Cat. 5 Cables



Application

The FutureCom™ SF/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- SF/UTP 300/24s cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Full shielding with foil shield and additional braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

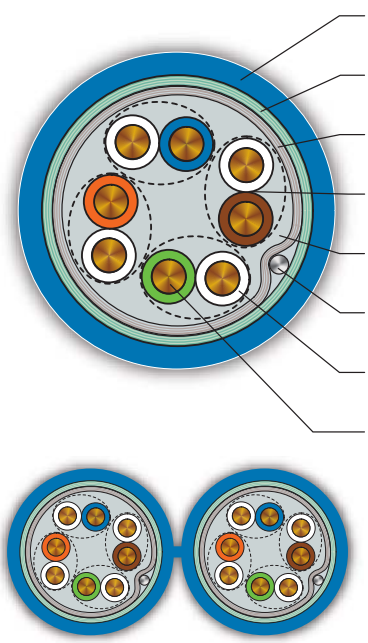
* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
SF/UTP 300/24s 4P	5_e	4	0.39	Yes	blue	112	5.8	38	1000	**CCXDES-C0047-C001-L7**
SF/UTP 300/24s 8P	5_e	8	0.80	Yes	blue	223	6.0 x 13.3	80	1000	**CCXDES-C0087-C001-L7**

FutureCom™ D

F/UTP 300/24 FRNC, Cat. 5 Cables



Application

The FutureCom™ F/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are foil shielded (F/UTP). The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- F/UTP 300/24 cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Double foil shielding and additional copper wire
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-3-24 and EN 50266-2-4
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

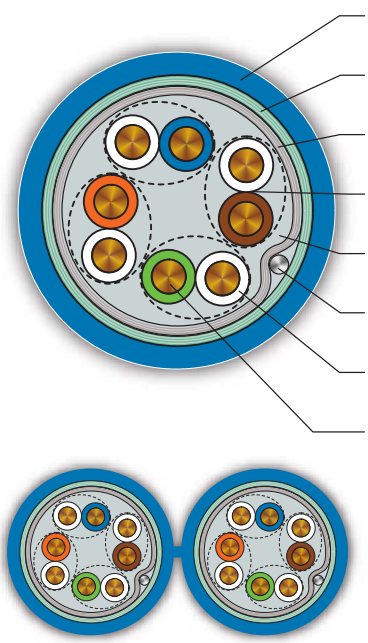
Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
F/UTP 300/24 4P	5_e	4	0.46	Yes	blue	93	6.1	40	1000	**CCXDEE-C0047-C001-L7**
F/UTP 300/24 4P	5_e	4	0.46	Yes	blue	93	6.1	40	305	**CCXDEE-C0047-C001-X1***
F/UTP 300/24 8P	5_e	8	0.94	Yes	blue	186	6.2 x 13.5	82	1000	**CCXDEE-C0087-C001-L7**

* X1 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ D

F/UTP 300/24 PVC, Cat. 5 Cables



Application

The FutureCom™ F/UTP 300/24 cable is designed for applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are foil shielded (F/UTP). The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- F/UTP 300/24 cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Double foil shielding and additional copper wire
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	PVC, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
F/UTP 300/24 4P	5_e	4	0.41	No	blue	93	5.8	36	1000	**CCXDLE-C0047-C001-L7**
F/UTP 300/24 4P	5_e	4	0.41	No	blue	93	5.8	36	305	**CCXDLE-C0047-C001-X1***
F/UTP 300/24 8P	5_e	8	0.94	No	blue	186	6.2 x 13.5	79	1000	**CCXDLE-C0087-C001-L7**

* X1 cables are delivered in a Reelex box. All other cables are delivered on disposable reels.

FutureCom™ D

S100e and S100eL Module Technology

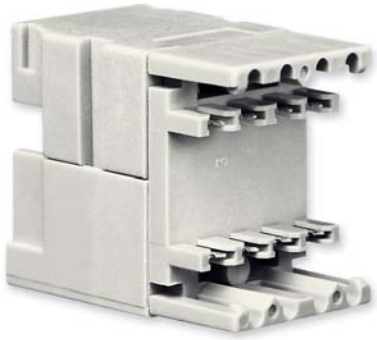
Features

- Fully compatible with all modular LANscape® systems
- Wide range of installation options
- Few individual components
- High-level component density
- Individual shielding
- Halogen-free
- Flame retardant, fire Class UL94 V-0

Individual components of the S100e Module

FutureCom™ S100 Technology

- Optimised construction with printed circuit board for bandwith of more than 100 MHz
- More than 1500 connector cycles possible
- Proven IDC technology for wires with AWG 24 to AWG 23
- Module reusable several times



S100e Basic Module

Application

- Wire management using TIA/EIA 568 A/B coding
- Rapid assembly time
- Easy handling
- Compatible with all FutureCom S/FTP, F/FTP and F/UTP cables

S100e / S100eL Wire Management

S100e and S100eL Modules

S100e Module

- Quick and easy to install
- No special tools required
- IDC connection (IDC = Insulation Displacement Contacts)
- High density
- Universal application in all modular LANscape® components
- Negligible disturbance effects from interference through the individual shielding of the modules
- Usage of additional cable strain relief CAXCSN-00000-C001 possible for increased pulling forces
- Category 5 (2002) / 5e

Description	Units per Delivery	Order Number
S100e Module, 1x RJ45, shielded, Cat. 5 (2002) / 5e, for wire diameter AWG24 to AWG23 (F/UTP and SF/UTP cables), incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
grey	1/1	CAXDSM-00100-C001

Description	Units per Delivery	Order Number
S100e Double Module, 2x RJ45, shielded, Cat. 5 (2002) / 5e, for wire diameter AWG24 to AWG23 (F/UTP and SF/UTP cables), incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
grey	1/1	CAXDSM-00200-C001

Description	Units per Delivery	Order Number
S100eL Module, 1x RJ45, shielded, Cat. 5 (2002) / 5e, for wire diameter AWG23 to AWG22 (PiMF cable), incl. copper conducting tape for installation in LANscape modular patch panels, outlets and floor box solutions		
grey	1/1	CAXGSM-00100-C001

A class E link can be constructed in conjunction with an S/FTP cable and the corresponding patch cords.

FutureCom™ D

S100e Outlets and Patch Panel

S100e Outlets

Description	Units per Delivery	Order Number
S100e Outlet, 2x RJ45, Cat. 5 (2002) / 5e, shielded, inclined, incl. mounting frame with grounding flaps, central plate 50 x 50 mm with designation window, screw fixing, copper conducting tape (without faceplate)		
white, RAL 9010	1/1	CAXDSD-S0201-C001
pearl white, RAL 1013	1/1	CAXDSD-S0202-C001

Features

- Easy and quick installation of system modules
- Recyclable, high-grade steel, stainless
- Two standardised grounding latches
- Integrated cable strain relief for optimal strain relief of each cable
- For Patch Panel accessories see page 209

S100e Patch Panel 19“, incl. 24 S100e modules

Description	Units per Delivery	Order Number
S100e Patch Panel 19“, shielded, Cat. 5 (2002) / 5e, including 24 FutureCom™ S100e modules and copper conducting tape, with integrated cable strain relief, 1 U, high-grade steel front panel		
high-grade steel	1/1	CAXDSV-02400-C001

S100e Outlets and Patch Panel

Application

The FutureCom™ S100e double module outlet with one RJ45 double module is suitable for the transmission of digital data signals and analogue voice transmission in compliance with class D ISO/IEC 11801 (2002) and EN 50173-1 (2003).

No special tools are required for either the termination of modules onto cables or the installation of the modules into outlets.

Features

- Suitable for Rutenbeck compatible central plates
- Suitable for ISO 55-65 raceway, surface, flush or floor box mounting
- Stable galvanised frame with compact design and small dimensions
- No special tools required
- recyclable

Description	Units per Delivery	Order Number
S100e Double Module Outlet, 2x RJ45, Cat. 5 (2002) / 5e, inclined, incl. mounting frame with grounding flaps and copper conducting tape (suitable for Rutenbeck compatible central plates)		
silver	1/1	CAXDSD-S0200-C001

Installation variant

Bill of materials

- S100e double outlet

  1 x CAXDSD-S0200-C001

Assembled with Busch & Jäger central plate and face plate

FutureCom™ D

S100eL Outlets and Patch Panel

S100eL Outlets

Description	Units per Delivery	Order Number
S100eL Outlet, 2x RJ45, Cat. 5 (2002) / 5e, inclined, incl. mounting frame with grounding flaps, 50 x 50 mm central plate with designation window, screw fixings, copper conducting tape (without face plate)		
white, RAL 9010	1/1	CAXGSD-S0201-C001
white, RAL 9010	1/1	CAXGSD-S0202-C001

Features

- Easy and quick installation of system modules
- Recyclable, high-grade steel, stainless
- Two standardised grounding latches
- Integrated cable strain relief for optimal strain relief of each cable
- For Patch Panel accessories see page 209

S100eL Patch Panel 19“, incl. 24 S100eL modules

Description	Units per Delivery	Order Number
S100eL Patch Panel 19“, shielded, Cat. 5 (2002) / 5e, including 24 FutureCom™ S100eL modules and copper conducting tape, with integrated cable strain relief, 1 U, high-grade steel front panel		
high-grade steel	1/1	CAXGSV-02400-C001

A Class E link can be constructed using S100eL patch panels and outlets, in conjunction with an S/FTP data cable and the corresponding patch cords.

FutureCom™ D

Patch Cords, RJ45 - RJ45

Description

The application-neutral FutureCom™ D patch cords have four stranded pairs sheathed with a foil shield (F/UTP) and additional with a braid shield (SF/UTP). They are assembled with a shielded RJ45 connector on each end.

The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- SF/UTP flex cable, specified up to 300 MHz
- Application-neutral due to using all four pairs of RJ45 connectors
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class D (2002) link specification
- Category 5 (2002) / 5e

Ordering Information

Length	grey	blue	yellow	green	red	black
0.5 m	CCADGF-D1002-A005-C0	on request	on request	on request	on request	on request
1 m	CCADGF-D1002-A010-C0	CCADGF-D2002-A010-C0	CCADGF-D3002-A010-C0	CCADGF-D4002-A010-C0	CCADGF-D5002-A010-C0	CCADGF-D6002-A010-C0
2 m	CCADGF-D1002-A020-C0	CCADGF-D2002-A020-C0	CCADGF-D3002-A020-C0	CCADGF-D4002-A020-C0	CCADGF-D5002-A020-C0	CCADGF-D6002-A020-C0
3 m	CCADGF-D1002-A030-C0	CCADGF-D2002-A030-C0	CCADGF-D3002-A030-C0	CCADGF-D4002-A030-C0	CCADGF-D5002-A030-C0	CCADGF-D6002-A030-C0
5 m	CCADGF-D1002-A050-C0	CCADGF-D2002-A050-C0	CCADGF-D3002-A050-C0	CCADGF-D4002-A050-C0	CCADGF-D5002-A050-C0	CCADGF-D6002-A050-C0
10 m	CCADGF-D1002-A100-C0	CCADGF-D2002-A100-C0	CCADGF-D3002-A100-C0	CCADGF-D4002-A100-C0	CCADGF-D5002-A100-C0	CCADGF-D6002-A100-C0

Other lengths upon request

FutureCom™ D

Patch Cords, RJ45 - RJ45 crossed

Description

The crossed FutureCom™ D patch cords have four stranded pairs sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP). They are assembled with a shielded RJ45 connector on each end.

The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in various lengths and colours.

Features

- SF/UTP flex cable, specified up to 300 MHz
- Crossed version
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Outstanding transmission characteristics according to class D (2002) link specification
- Category 5 (2002) / 5e

SF/UTP flex/26 Patch Cords, for 10/100 Base-T Applications, crossed (Pins 1.2 -3.6)

Length	red
0.5 m	CCADGF-D5102-A005-C0
1 m	CCADGF-D5102-A010-C0
2 m	CCADGF-D5102-A020-C0
3 m	CCADGF-D5102-A030-C0
5 m	CCADGF-D5102-A050-C0
10 m	CCADGF-D5102-A100-C0

Other lengths upon request

FutureCom™ D

Plug & Play™ Solutions,

Application

Plug & Play™ installation in horizontal wiring

Description

The FutureCom™ S100e Plug & Play Solution Packages are factory pre-terminated cables with S100e modules at each end.
They are generally offered with FutureCom F/UTP 300/24 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S100e Solution Package, F/UTP300/24 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S100e modules			
F/UTP 300/24-10	10 m	1/1	CCADEE-B2044-A100-C0
F/UTP 300/24-15	15 m	1/1	CCADEE-B2044-A150-C0
F/UTP 300/24-20	20 m	1/1	CCADEE-B2044-A200-C0
F/UTP 300/24-25	25 m	1/1	CCADEE-B2044-A250-C0
F/UTP 300/24-30	30 m	1/1	CCADEE-B2044-A300-C0
F/UTP 300/24-35	35 m	1/1	CCADEE-B2044-A350-C0
F/UTP 300/24-40	40 m	1/1	CCADEE-B2044-A400-C0
F/UTP 300/24-45	45 m	1/1	CCADEE-B2044-A450-C0
F/UTP 300/24-50	50 m	1/1	CCADEE-B2044-A500-C0
F/UTP 300/24-55	55 m	1/1	CCADEE-B2044-A550-C0
F/UTP 300/24-60	60 m	1/1	CCADEE-B2044-A600-C0
F/UTP 300/24-65	65 m	1/1	CCADEE-B2044-A650-C0
F/UTP 300/24-70	70 m	1/1	CCADEE-B2044-A700-C0
F/UTP 300/24-75	75 m	1/1	CCADEE-B2044-A750-C0
F/UTP 300/24-80	80 m	1/1	CCADEE-B2044-A800-C0
F/UTP 300/24-85	85 m	1/1	CCADEE-B2044-A850-C0
F/UTP 300/24-90	90 m	1/1	CCADEE-B2044-A900-C0

7 Data Centre Solutions

7.1. Class F

7.1.1. S1200 Consolidation Point Cable 162

7.1.2. S1200 Solution Package, 1x S/FTP1200/22, 2S 163

7.2. 10GBase-T

7.2.1. S10^{TEN}e Solution Package, 1x S/FTP1000/23, 2S 165

7.2.2. S10^{TEN}e Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 166

7.2.3. S10^{TEN}e Solution Package, 6x S/FTP1000/23, 2S, sewed 167

7.2.4. S10^{TEN}e Consolidation Point Patch Cords 168

7.2.5. S10^{TEN} Solution Package, 1x S/FTP1000/23, 2S 169

7.2.6. S10^{TEN} Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 170

7.2.7. S10^{TEN} Solution Package, 6x S/FTP1000/23, 2S, sewed 171

7.2.8. S10^{TEN} Consolidation Point Patch Cords 172

7.3. Class E

7.3.1. S250 Solution Package, 1x S/FTP1000/23,2S 174

7.3.2. S250 Solution Package, 6x S/FTP1000/23, 2S, with common outer jacket 175

7.3.3. S250 Solution Package, 6x S/FTP1000/23, 2S, sewed 176

7.3.4. S250 Consolidation Point Patch Cords 177

7.4. Multi-Patch Cord Clamp 179

Data Centre Solutions

Class F, S1200 - S250

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ F consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded S1200 connector in compliance with IEC 61076-3-104 and one S250 module.
The zero halogen consolidation point cables (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-3, Category C and EN 50266-2-4.

They are available in various lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- S/FTP flex cable, Category 7
- Outstanding transmission characteristics according to 10GBase-T

Ordering Information

Description	Length	Units per Delivery	Order Number
S1200 consolidation point cable, S/FTP 1200/22, 4 pairs, shielded, FRNC jacket, blue, application-neutral, pre-terminated with one S250 module and one S1200/4 connector			
S/FTP 1200/22-5	5 m	**1/1**	**CCAFCB-M2058-A050-C0**
S/FTP 1200/22-10	10 m	**1/1**	**CCAFCB-M2058-A100-C0**
S/FTP 1200/22-15	15 m	**1/1**	**CCAFCB-M2058-A150-C0**
S/FTP 1200/22-20	20 m	**1/1**	**CCAFCB-M2058-A200-C0**

Class F, S1200 - S1200

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom F Plug & Play Solution Packages are factory pre-terminated cables with S1200 modules at each end. They are generally offered with FutureCom S/FTP 1200/22 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S1200 Solution Package, S/FTP1200/22 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with two S1200 modules			
S/FTP 1200/22-10	10 m	1/1	CCAFCB-M2042-A100-C0
S/FTP 1200/22-15	15 m	1/1	CCAFCB-M2042-A150-C0
S/FTP 1200/22-20	20 m	1/1	CCAFCB-M2042-A200-C0
S/FTP 1200/22-25	25 m	1/1	CCAFCB-M2042-A250-C0
S/FTP 1200/22-30	30 m	1/1	CCAFCB-M2042-A300-C0
S/FTP 1200/22-35	35 m	1/1	CCAFCB-M2042-A350-C0
S/FTP 1200/22-40	40 m	1/1	CCAFCB-M2042-A400-C0
S/FTP 1200/22-45	45 m	1/1	CCAFCB-M2042-A450-C0
S/FTP 1200/22-50	50 m	1/1	CCAFCB-M2042-A500-C0
S/FTP 1200/22-55	55 m	1/1	CCAFCB-M2042-A550-C0
S/FTP 1200/22-60	60 m	1/1	CCAFCB-M2042-A600-C0
S/FTP 1200/22-65	65 m	1/1	CCAFCB-M2042-A650-C0
S/FTP 1200/22-70	70 m	1/1	CCAFCB-M2042-A700-C0
S/FTP 1200/22-75	75 m	1/1	CCAFCB-M2042-A750-C0
S/FTP 1200/22-80	80 m	1/1	CCAFCB-M2042-A800-C0
S/FTP 1200/22-85	85 m	1/1	CCAFCB-M2042-A850-C0
S/FTP 1200/22-90	90 m	1/1	CCAFCB-M2042-A900-C0
S/FTP 1200/22-95	95 m	1/1	CCAFCB-M2042-A950-C0

S1200 Patch Panel 19“

Features

- Specially designed for direct integration of S1200 modules
- Integrated shielded transitional spring for optimised shielding
- For Patch Panel accessories see page 209

Description	Units per Delivery	Order Number
S1200 Patch Panel 19“, for up to 24 FutureCom™ F S1200 modules, with integrated cable strain relief and shielded transitional spring, 1 U		
high-grade steel	1/1	CAXFSV-02400-C002

10GBase-T, S10^{TEN}e - S10^{TEN}e

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S10^{TEN}e Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The S/FTP 1000/23 cable is factory pre-terminated with an S10^{TEN}e module at each end.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN}e Solution Package, S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S10^{TEN}e modules			
S/FTP 1000/23-10	10 m	1/1	CCATDB-F2067-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCATDB-F2067-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCATDB-F2067-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCATDB-F2067-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCATDB-F2067-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCATDB-F2067-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCATDB-F2067-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCATDB-F2067-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCATDB-F2067-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCATDB-F2067-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCATDB-F2067-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCATDB-F2067-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCATDB-F2067-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCATDB-F2067-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCATDB-F2067-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCATDB-F2067-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCATDB-F2067-A900-C0

10GBase-T, 6x S10^{TEN}e - 6x S10^{TEN}e

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S10^{TEN}e Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
The special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S10^{TEN}e modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

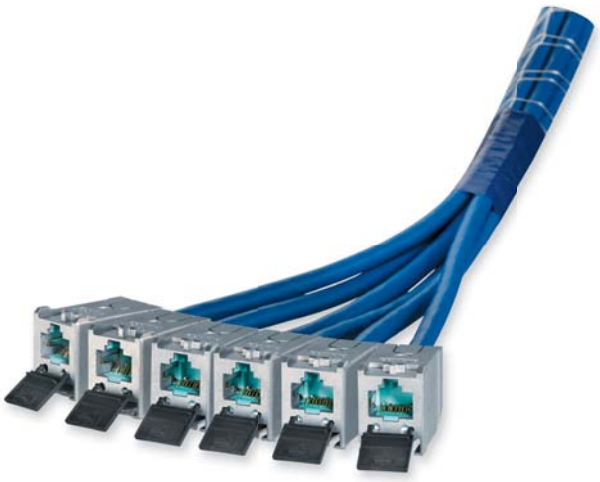
Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN}e Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10^{TEN}e modules at each end			
6x S/FTP 1000/23-10	10 m	**1/1**	**CCATDB-F2667-A100-C0**
6x S/FTP 1000/23-20	20 m	**1/1**	**CCATDB-F2667-A200-C0**
6x S/FTP 1000/23-30	10 m	**1/1**	**CCATDB-F2667-A300-C0**
6x S/FTP 1000/23-40	40 m	**1/1**	**CCATDB-F2667-A400-C0**

10GBase-T, 6x S10^{TEN}e - 6x S10^{TEN}e

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring



Description

The FutureCom™ sextuple S10^{TEN}e Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S10^{TEN}e modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN}e Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10^{TEN}e modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCATDB-F2667-A100-EN
6x S/FTP 1000/23-20	20 m	1/1	CCATDB-F2667-A200-EN
6x S/FTP 1000/23-30	30 m	1/1	CCATDB-F2667-A300-EN
6x S/FTP 1000/23-40	40 m	1/1	CCATDB-F2667-A400-EN

Data Centre Solutions

10GBase-T, S10^{TEN}e Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ 10TENe consolidation point cable has four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). It is assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S10^{TEN}e module.
The FutureCom™ 10TENe consolidation point cable offers high margins for transmission of digital data signals for future applications in systems up to 10GbE according to the new class E_A (ISO/IEC 11801 Amd 1:2008) respectively Cat.6_A (ANSI/TIA/EIA 568 B.2-10), EN 50173 and IEC 60603-7-5 Ed. 1.0. It is also suitable for Power over Ethernet (PoE) applications in compliance with IEEE 802.3af (2003) and the new PoE Plus applications.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.

They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 500 MHz in compliance with Class E_A and IEEE 802.3an
- S/FTP flex cable, Category 7
- High-quality RJ45 connector for 10 GbE systems
- Connector boot with latch protection

Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN}e consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S10^{TEN}e module and one RJ45 connector			
S/FTP flex/26-5	5 m	1/1	CCATGB-F1066-A050-C0
S/FTP flex/26-10	10 m	1/1	CCATGB-F1066-A100-C0
S/FTP flex/26-15	15 m	1/1	CCATGB-F1066-A150-C0
S/FTP flex/26-20	10 m	1/1	CCATGB-F1066-A200-C0

10GBase-T, S10^{TEN} - S10^{TEN}

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S10^{TEN} Plug & Play Solution Packages are factory pre-terminated cables with S10^{TEN} module at each end.
They are generally offered with FutureCom S/FTP 1000/23 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

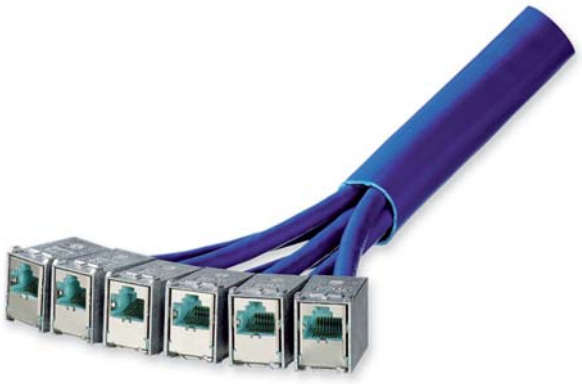
Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN} Solution Package, S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S10^{TEN} modules			
S/FTP 1000/23-10	10 m	1/1	CCATDB-F2063-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCATDB-F2063-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCATDB-F2063-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCATDB-F2063-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCATDB-F2063-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCATDB-F2063-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCATDB-F2063-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCATDB-F2063-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCATDB-F2063-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCATDB-F2063-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCATDB-F2063-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCATDB-F2063-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCATDB-F2063-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCATDB-F2063-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCATDB-F2063-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCATDB-F2063-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCATDB-F2063-A900-C0

10GBase-T, 6x S10^{TEN} - 6x S10^{TEN}

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring



Description

The FutureCom™ sextuple S10^{TEN} Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an.
This special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S10^{TEN} modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

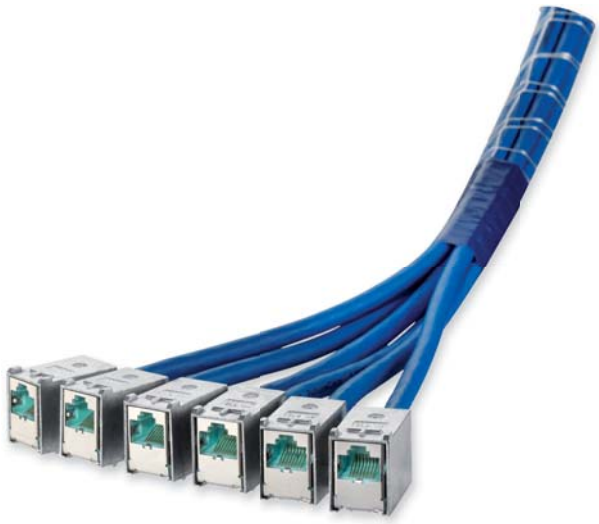
Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN} Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10^{TEN} modules at each end			
6x S/FTP 1000/23-10	10 m	**1/1**	**CCATDB-F2663-A100-C0**
6x S/FTP 1000/23-20	20 m	**1/1**	**CCATDB-F2663-A200-C0**
6x S/FTP 1000/23-30	30 m	**1/1**	**CCATDB-F2663-A300-C0**
6x S/FTP 1000/23-40	40 m	**1/1**	**CCATDB-F2663-A400-C0**

10GBase-T, 6x S10^{TEN} - 6x S10^{TEN}

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring



Description

The FutureCom™ sextuple S10^{TEN} Plug & Play Solution Packages are specified up to 500 MHz and provide outstanding performance for the transmission of digital data signals for future applications up to 10GbE in compliance with IEEE 802.3an.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S10^{TEN} modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN} Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S10^{TEN} modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCATDB-F2663-A100-EN
6x S/FTP 1000/23-20	20 m	1/1	CCATDB-F2663-A200-EN
6x S/FTP 1000/23-30	30 m	1/1	CCATDB-F2663-A300-EN
6x S/FTP 1000/23-40	40 m	1/1	CCATDB-F2663-A400-EN

10GBase-T, S10^{TEN} Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ 10TEN consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S10^{TEN} module.
The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 500 MHz in compliance with Class E_A and IEEE 802.3an

Ordering Information

Description	Length	Units per Delivery	Order Number
S10^{TEN} consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S10^{TEN} module and one RJ45 connector			
S/FTP flex/26-5	5 m	**1/1**	**CCATGB-F1062-A050-C0**
S/FTP flex/26-10	10 m	**1/1**	**CCATGB-F1062-A100-C0**
S/FTP flex/26-15	15 m	**1/1**	**CCATGB-F1062-A150-C0**
S/FTP flex/26-20	20 m	**1/1**	**CCATGB-F1062-A200-C0**

10GBase-T

Features

- Suitable for all LANscape® modules (FO and Copper)
- Robust metal construction, high-grade steel
- For Patch Panel accessories see page 209

FutureCom 10TEN Patch Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
FutureCom 10TEN Patch Panel 19“, for up to 24 FutureCom™ copper or LANscape fibre optic modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	WAXTSV-02400-C001

FutureCom 10TEN Patch Panel 19“, 1 U, black

Description	Units per Delivery	Order Number
FutureCom 10TEN Patch Panel 19“, for up to 24 FutureCom copper or LANscape fibre optic modules, with integrated cable strain relief, 1 U		
black	1/1	WAXTSV-02408-C001

Data Centre Solutions

Class E, S250 - S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ S250 Plug & Play Solution Packages are factory pre-terminated cables with S250 modules at each end.
They are generally offered with FutureCom S/FTP 1000/23 cables.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Solution Package, S/FTP1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 2 S250 modules			
S/FTP 1000/23-10	10 m	1/1	CCAEDB-D2050-A100-C0
S/FTP 1000/23-15	15 m	1/1	CCAEDB-D2050-A150-C0
S/FTP 1000/23-20	20 m	1/1	CCAEDB-D2050-A200-C0
S/FTP 1000/23-25	25 m	1/1	CCAEDB-D2050-A250-C0
S/FTP 1000/23-30	30 m	1/1	CCAEDB-D2050-A300-C0
S/FTP 1000/23-35	35 m	1/1	CCAEDB-D2050-A350-C0
S/FTP 1000/23-40	40 m	1/1	CCAEDB-D2050-A400-C0
S/FTP 1000/23-45	45 m	1/1	CCAEDB-D2050-A450-C0
S/FTP 1000/23-50	50 m	1/1	CCAEDB-D2050-A500-C0
S/FTP 1000/23-55	55 m	1/1	CCAEDB-D2050-A550-C0
S/FTP 1000/23-60	60 m	1/1	CCAEDB-D2050-A600-C0
S/FTP 1000/23-65	65 m	1/1	CCAEDB-D2050-A650-C0
S/FTP 1000/23-70	70 m	1/1	CCAEDB-D2050-A700-C0
S/FTP 1000/23-75	75 m	1/1	CCAEDB-D2050-A750-C0
S/FTP 1000/23-80	80 m	1/1	CCAEDB-D2050-A800-C0
S/FTP 1000/23-85	85 m	1/1	CCAEDB-D2050-A850-C0
S/FTP 1000/23-90	90 m	1/1	CCAEDB-D2050-A900-C0

Class E, 6x S250 - 6x S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S250 Plug & Play Solution Packages are specified up to 250 MHz and provide outstanding performance for the transmission of digital data signals for 1GbE in compliance with class E according to ISO/IEC 11801.
This special cable consists of six S/FTP 1000/23 cables with a common outer jacket and is factory pre-terminated with six S250 modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S250 modules at each end			
6x S/FTP 1000/23-10	10 m	1/1	CCAEDB-D2650-A100-C0
6x S/FTP 1000/23-20	20 m	1/1	CCAEDB-D2650-A200-C0
6x S/FTP 1000/23-30	30 m	1/1	CCAEDB-D2650-A300-C0
6x S/FTP 1000/23-40	40 m	1/1	CCAEDB-D2650-A400-C0

Data Centre Solutions

Class E, 6x S250 - 6x S250

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ sextuple S250 Plug & Play Solution Packages are specified up to 250 MHz and provide outstanding performance for the transmission of digital data signals for 1GbE in compliance with class E according to ISO/IEC 11801.
This special cable consists of six sewed S/FTP 1000/23 cables and is factory pre-terminated with six S250 modules at each end.

Features

- Plug & Play Installation
- Allows pulling of six cables at once
- 100% factory tested quality
- No wire map failure during installation
- Short installation time

Ordering Information

Description	Length	Units per Delivery	Order Number
S250 Plug & Play Solution Package, 6x S/FTP 1000/23 cable, 4 pairs, shielded, FRNC jacket, blue, pre-terminated with 6 S250 modules at each end			
6x S/FTP 1000/23-10	10 m	**1/1**	**CCAEDB-D2650-A100-EN**
6x S/FTP 1000/23-20	20 m	**1/1**	**CCAEDB-D2650-A200-EN**
6x S/FTP 1000/23-30	30 m	**1/1**	**CCAEDB-D2650-A300-EN**
6x S/FTP 1000/23-40	40 m	**1/1**	**CCAEDB-D2650-A400-EN**

Class E, S250 Consolidation Point Patch Cords

Application

Plug & Play™ installation in Data Centre or in LANscape® Consolidation Point Housings

Description

The FutureCom™ E consolidation point cables have four individual foil-shielded pairs (PiMF) and an additional braid shield (S/FTP). They are assembled with one shielded RJ45 connector in compliance with IEC 60603-7 and one S250 module. The zero halogen patch cords (LSZH) are non-corrosive according to IEC 60754-2 (FRNC) and EN 50267, low smoke according to IEC 61034 and EN 50268 and flame retardant according to IEC 60332-1, Category B and EN 50266-2-1.
They are available in different lengths.

Features

- Plug & Play Installation
- 100% factory tested quality
- No wire map failure during installation
- Short installation time
- Consolidation Point patch cable specified up to 250 MHz in compliance with Class E
- S/FTP flex cable, Category 7

Ordering Information

Description	Length	Units per Delivery	Order Number
FutureCom E consolidation point patch cord, S/FTP flex/26, 4 pairs, shielded, FRNC jacket, grey, application-neutral, pre-terminated with one S250 module and one RJ45 connector			
S/FTP flex/26-5	5 m	1/1	CCAEGB-D1052-A050-C0
S/FTP flex/26-10	10 m	1/1	CCAEGB-D1052-A100-C0
S/FTP flex/26-15	15 m	1/1	CCAEGB-D1052-A150-C0
S/FTP flex/26-20	20 m	1/1	CCAEGB-D1052-A200-C0

Features

- Suitable for all LANscape® modules (FO and Copper)
- Robust metal construction, high-grade steel
- For Patch Panel accessories see page 209

Patch Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
19“ Patch Panel, for up to 24 LANscape fibre optic or FutureCom™ copper modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	WAXWSV-02400-C001

Patch Panel 19“, 1 U, black

Description	Units per Delivery	Order Number
19“ Patch Panel, for up to 24 LANscape fibre optic or FutureCom copper modules, with integrated cable strain relief, 1 U		
black	1/1	WAXWSV-02408-C001

Data Centre Solutions

Multi-Patch Cord Clamp

Application

Plug & Play™ installation in Data Centre Networks or horizontal wiring

Description

The FutureCom™ Plug & Play Multipatch CP Patch Cords are pre-assembled links with 12x or 16x RJ45 connectors in one multi patch cord clamp at one end and 12 or 16 system modules at the other end.
The multi patch cord clamp allows a simultaneous disconnecting and connecting of all 12 or 16 connectors.
Using these CP patch cords the installation time especially in data centres could be dramatically reduced. This is a big advantage later on if there is a need of changing an active component in case of damage.
Furthermore installation mistakes trough permutation will be avoided.

CP patch cords with multi patch clamp are available in different length and colours.

Features

- Allows connecting or disconnecting up to 16 CP patch cords at the same time
- Outstanding transmission characteristics up to 10GBase-T
- 100% factory tested quality
- No wire map failure during installation
- S/FTP flex cable, Category 7
- Halogen-free jacket, flame retardant
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Application-neutral due to using all four pairs of RJ45 connectors
- Convenient CP patch cords with multipatch clamp for different active components (Cisco, Alterpath,...) available on request

8 FutureCom™ Hardware

8.1. Outlets and Accessories 182

8.2. Outlets - UK Installation Environments 192

8.3. Outlets - France Installation Environments 195

8.4. Floor box solutions 197

8.5. Patch Panels and Accessories 205

8.6. Consolidation Point Housings 210

Outlets and Accessories

Blank Covers

- Suitable for closing unused ports in LANscape® modular hardware

Description	Units per Delivery	Order Number
Blank Cover, 1 position for installation in modular LANscape patch panels, outlets and floor box solutions		
white, RAL 9010	6/1	WAXWSM-00101-C001
black, RAL 9005	6/1	WAXWSM-00108-C001

Frame set, straight

- Central plate dimensions of 50 x 50 mm. Can be combined with “DELTAprofil“ and “DELTAfläche“ face plates, as well as face plates from other manufacturers
- Designation window

Description	Units per Delivery	Order Number
Frame set, straight, for 2 LANscape modules, including mounting frame and 50 x 50 mm central plate with designation window, screw fixing		
white, RAL 9010	1/1	WAXWSE-G0201-C001
pearl white, RAL 1013	1/1	WAXWSE-G0202-C001

Frame set, inclined, projecting, 2P

- Central plate dimensions of 50 x 50 mm. Can be combined with “DELTAprofil“ and “DELTAfläche“ face plates, as well as face plates from other manufacturers
- Designation window

Description	Units per Delivery	Order Number
Frame set for 2 LANscape modules, inclined, projecting , incl. mounting frame and 50 x 50 mm central plate with designation window and dust protection flaps		
white, RAL 9010	1/1	WAXWSE-V0201-C001
pearl white, RAL 1013	1/1	WAXWSE-V0202-C001

Outlets and Accessories

Frame set, inclined

- Central plate dimensions of 50 x 50 mm. Can be combined with "DELTAprofil" and "DELTAfläche" face plates, as well as face plates from other manufacturers
- Designation window

Description	Units per Delivery	Order Number
Frame set, inclined, for 2 LANscape® modules, including mounting frame with grounding flap and 50 x 50 mm central plate with designation window, screw fixing		
white, RAL 9010	1/1	WAXWSE-S0201-C001
pearl white, RAL 1013	1/1	WAXWSE-S0202-C001

Design Line - Special Colour Options

Description	Units per Delivery	Order Number
Frame set, inclined, for 2 LANscape modules, including mounting frame with grounding flap and 50 x 50 mm central plate with designation window, screw fixing		
light grey	1/1	WAXWSE-S0203-C001

Description	Units per Delivery	Order Number
Frame set, inclined, for 2 LANscape modules, including mounting frame with grounding flap and 50 x 50 mm central plate with designation window, screw fixing		
black, RAL 9005	1/1	WAXWSE-S0208-C001

Outlets and Accessories

Frame set, inclined, projecting, 3P

Description	Units per Delivery	Order Number
Frame set, inclined, projecting for 3 LANscape® modules, including mounting frame and triple housing with designation window and dust protection flaps, also as 80 x 80 mm face plate		
white, RAL 9010	1/1	WAXWSE-V0301-C001
pearl white, RAL 1013	1/1	WAXWSE-V0302-C001

Frame set, inclined, projecting, 6P

Description	Units per Delivery	Order Number
Frame set, inclined, projecting for 6 LANscape modules, including mounting frame and two triple housings with designation window and dust protection flaps, also as 151 x 80 mm face plate		
white, RAL 9010	1/1	WAXWSE-V0601-C001
pearl white, RAL 1013	1/1	WAXWSE-V0602-C001

Installation variant

Bill of materials

- Frame set, inclined, projecting, w, 6P (LANscape)
  1 x WAXWSE-V0601-C001
- S250 Module
  2 x CAXESM-00100-C001
- Labelling Icon, bu
  4 x WAXWSE-00004-C001
- Labelling Icon, bk
  2 x WAXWSE-00008-C001
- S/FTPfx,Cat.6,bu,2xRJ45,4P,3m
  2 x CCAEGB-G2002-A030-C0

Outlets and Accessories

Description

All frame sets with a 50 x 50 mm central plate as well as different combi-frames and the 3- and 6-port frame sets offer the opportunity to code each port with labelling icons.
The icons indicate port applications and show a telephone or a computer (LAN operation). They are available in six different colours.

Description	Units per Delivery	Order Number
Labelling Icon, computer / telephone		
gray, RAL 7042	120/1	WAXWSE-00003-C001
blue, RAL 5015	120/1	WAXWSE-00004-C001
yellow, RAL 1021	120/1	WAXWSE-00005-C001
green, RAL 6029	120/1	WAXWSE-00006-C001
red, RAL 3000	120/1	WAXWSE-00007-C001
blue, RAL 5015	120/1	WAXWSE-00008-C001

Features

- For LANscape® frame sets and outlets with designation windows

Designation Label Sheet DIN A4 for Outlets

Description	Units per Delivery	Order Number
DIN A4 Designation Label Sheet, with 150 designation strips for LANscape outlets and frame sets		
white	10/1	WAXWSE-00001-C009

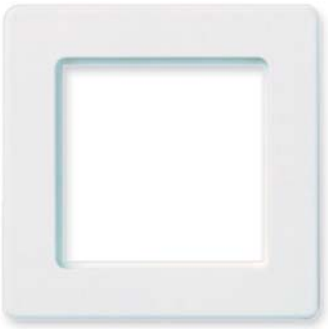
Outlets and Accessories

Face Plates for 50 x 50 mm Central Plates

Description	Units per Delivery	Order Number
"DELTAprofil" Face Plate, 80 x 80 mm, for LANscape® outlets with 50 x 50 mm central plate		
white, RAL 9010	1/1	WAXWSE-00001-C001
pearl white, RAL 1013	1/1	WAXWSE-00002-C001

Face Plates, Deltafläche, 75 x 75 mm

Description	Units per Delivery	Order Number
"DELTAfläche" Face Plate, 75 x 75 mm, for LANscape outlets with 50 x 50 mm central plate		
white, RAL 9010	1/1	WAXWSE-00001-C002
pearl white, RAL 1013	1/1	WAXWSE-00002-C002



Surface Mount Housing for "DELTAfläche" Outlets

Description	Units per Delivery	Order Number
"DELTAfläche" Surface Mount Housing for individual configuration of LANscape surface outlets, 75 x 75 mm		
white, RAL 9010	1/1	WAXWSE-00001-C003
pearl white, RAL 1013	1/1	WAXWSE-00002-C003

Outlets and Accessories

Face Plates for 50 x 50 mm Central Plates

Description	Units per Delivery	Order Number
"UNIfläche" Face Plate, 80 x 80 mm, for LANscape® outlets with 50 x 50 mm central plate		
white, RAL 9010	1/1	WAXWSE-00001-C011
pearl white, RAL 1013	1/1	WAXWSE-00002-C011

Surface Mount Housing for "UNIfläche" Outlets

Description	Units per Delivery	Order Number
"DELTAfläche" Surface Mount Housing for individual configuration of LANscape surface outlets, 75 x 75 mm		
white, RAL 9010	1/1	WAXWSE-00001-C012
pearl white, RAL 1013	1/1	WAXWSE-00002-C012

Face Plate 80.5 x 80.5 mm for Tehalit raceways

Description	Units per Delivery	Order Number
Face Plate 80.5 x 80.5 mm, for Tehalit raceways, suitable for outlets with 50 x 50 mm central plate		
white, RAL 9010	1/1	WAXWSE-00001-C013

Outlets and Accessories

Combi-Frames “DELTAfläche“

Description	Units per Delivery	Order Number
Combi-frame “DELTAfläche“, 75 x 75 mm, inclined, for 3 LANscape® modules		
white, RAL 9010	1/1	WAXWSE-S0301-C002
pearl white, RAL 1013	1/1	WAXWSE-S0302-C002

Installation variant

Bill of materials

- Face Plate “DELTAfläche“, 75 x 75 mm, w
  1 x WAXWSE-00001-C002
- S100^{e} Module
  2 x CAXDSM-00100-C001
- MT-RJ module, multimode OM1/OM2
  1 x LAXLSM-00101-C004

Combi-Frames “DELTAprofil“

Description	Units per Delivery	Order Number
Combi-frame “DELTAprofil“, 80 x 80 mm, inclined, for 3 LANscape modules		
white, RAL 9010	1/1	WAXWSE-S0301-C001
pearl white, RAL 1013	1/1	WAXWSE-S0302-C001

Installation variant

Bill of materials

- Combi frame “DELTAprofil“, inclined, w, 3P
  1 x WAXWSE-S0301-C001
- S250 Module
  2 x CAXESM-00100-C001
- LC Duplex Module, multimode OM1
  1 x LAXLSM-00101-C007

Outlets and Accessories

Combi-Frame 67 x 110mm

Description	Units per Delivery	Order Number
Combi-Frame 67 x 110 mm, for installation of two single LANscape® modules, inclined		
white, RAL 9010	1/1	WAXWSE-V0201-C004

Surface Mount Housing 67 x 110mm

Description	Units per Delivery	Order Number
Surface Mount Housing 67 x 110 mm, for combi-frame 67x110 mm (WAXWSE-V0201-C004)		
white, RAL 9010	1/1	WAXWSE-00001-C008

Surface Mount Housing 75 x 65 mm, 2 Port

Description	Units per Delivery	Order Number
Surface Mount Housing 75 x 65 mm, with self-closing shutter, for 2 FutureCom™ modules		
white, RAL 9010	1/1	CAXCSE-U0201-C001

Outlets and Accessories

Application

The following brackets can be used for the quick and simple installation of outlets and frame sets in raceways.

They support the minimum bending radius requirements for copper and fibre optic cables. In order to separate network components from power systems, the brackets are supplied with a removable half-shell partition, which can be optionally inserted.

An additional advantage of the half-shell partition is the protection of fibre optic connections against mechanical damage during pulling of new cables. The brackets are suitable for Tehalit and Ackermann raceways with T-groove mounting.

Description	Units per Delivery	Order Number
Brackets for raceway mounting of outlets and frame sets, T-groove mounting, height 50 mm, with half-shell partition		
white, RAL 9010	1/1	WAXWSE-00001-C010

Description	Units per Delivery	Order Number
Brackets for raceway mounting of outlets and frame sets, T-groove mounting, height 55 mm, with half-shell partition		
black, RAL 9005	1/1	WAXWSE-00008-C002

Outlets and Accessories

Application

This frame set is developed in co-operation with Tehalit to support installation possibilities of different LANscape® modules in BR and BR netway® raceways. It is possible to install the following modules:
Ecoline: S100^{e}, S100^{eL}, S250, S10^{TEN}, S10^{TEN}e, ST and MT-RJ simplex modules
Inline: S100^{e}, S100^{eL}, S250, S10^{TEN}, S10^{TEN}e, ST, SC duplex, MT-RJ simplex, MT-RJ triplex and LC modules
The different central plates, bezels and mounting inserts are available from Tehalit.

Frame Set for TEHALIT Raceways

Description	Units per Delivery	Order Number
Frame set for Tehalit BR/ BRN raceways, inclined for 2 LANscape modules, suitable for Tehalit central plates		
silver	1/1	WAXWSE-S0200-TE01

Installation variant

Bill of materials

- Frame set for Tehalit raceways
  1 x WAXWSE-S0200-TE01
- S250 Module
  2 x CAXESM-00100-C001

Mounted in BR/BRN Tehalit raceway, assembled with G3544 9100 (Tehalit) central plate and G3718 9010 (Tehalit) face plate.

Outlets - UK Installation Environments

Face plate, 87 x 87 mm

Description	Units per Delivery	Order Number
Face Plate, 87 x 87 mm, for one housing, including screws for frame assembly in installation outlets (Suitable surface mount housing: WAXWSE-00001-C004)		
white, RAL 9010	1/1	WAXWSE-00001-C005

Surface Mount Housing, 87 x 87 mm

Description	Units per Delivery	Order Number
Surface Mount Housing, 87 x 87 mm, including two screws, for face plate 87 x 87 mm		
white, RAL 9010	1/1	WAXWSE-00001-C004

Face plate, 147 x 87 mm

Description	Units per Delivery	Order Number
Face Plate, 147 x 87 mm, for two housings, including screws for frame assembly in installation outlets (Suitable surface mount housing : WAXWSE-00001-C006)		
white, RAL 9010	1/1	WAXWSE-00001-C007

Surface Mount Housing, 147 x 87 mm

Description	Units per Delivery	Order Number
Surface Mount Housing, 147 x 87 mm, including two screws, for face plate 147 x 87 mm		
white, RAL 9010	1/1	WAXWSE-00001-C006

Outlets - UK Installation Environments

Universal Housing, inclined, projecting, 2P

- Surface mount housing suitable for 87 x 87 mm and 147 x 87 mm face plates (see page 192)

Description	Units per Delivery	Order Number
Universal housing, inclined, projecting, for installation of two FutureCom™ modules in 147 x 87 mm and 87 x 87 mm face plates, central partition provided		
white, RAL 9010	1/1	WAXWSE-V0201-C002

Module Housing, inclined, projecting, 2P

Description	Units per Delivery	Order Number
Module housing, inclined, projecting, with self-closing shutters for installation of two FutureCom modules in 147 x 87 mm and 87 x 87 mm face plates		
white, RAL 9010	1/1	CAXCSE-V0201-C001

Outlets - UK Installation Environments

Module housing 25 x 38 mm, inclined

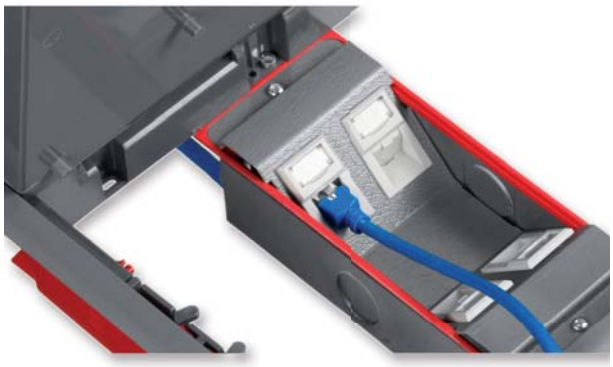
- Self-closing shutter
- Designation window

Description	Units per Delivery	Order Number
Module housing 25 x 38 mm, inclined , with self-closing shutter for installation of one FutureCom™ module, designation window		
white, RAL 9010	1/1	CAXCSE-S0101-C002

Installation variant

Bill of materials

- Module housing 25 x 38 mm, inclined
  4 x CAXCSE-S0101-C002
- S/FTPfx,Cat.6,bu,2xRJ45,4P,3m
  1 x CCAEGB-G2002-A030-C0



Module housing 25 x 50 mm, inclined

- Self-closing shutter
- Designation window

Description	Units per Delivery	Order Number
Module housing 25 x 50 mm, inclined , with self-closing shutter for installation of one FutureCom module, designation window		
white, RAL 9010	1/1	CAXCSE-S0101-C001

Outlets - France Installation Environments

Combi-Frame 22.5 x 45 mm

- Self-closing shutter
- Coding possibility with labelling icons for each port
- Designation window
- 22.5 x 45 mm footprint, e.g. compatible with Legrand „Mosaic“

Description	Units per Delivery	Order Number
Combi-Frame 22.5 x 45 mm, with self-closing shutter for the installation of one FutureCom™ module, straight, designation window and coding possibility		
white, RAL 9010	1/1	CAXCSE-G0201-C012

Combi-Frame 45 x 45 mm

- Self-closing shutter
- Coding possibility with labelling icons for each port
- Designation window
- 45 x 45 mm footprint, e.g. compatible with Legrand „Mosaic“

Description	Units per Delivery	Order Number
Combi-Frame 45 x 45 mm, with self-closing shutters for the installation of 2 FutureCom modules, straight, designation window and coding possibility		
white, RAL 9010	1/1	CAXCSE-G0201-C011

Outlets - France Installation Environments

Combi-Frame 45 x 45 mm for VanGeel Columns

Description	Units per Delivery	Order Number
Combi-Frame for VanGeel Columns, 45 x 45 mm, with self-closing shutters for the installation of 2 FutureCom™ modules, straight		
white, RAL 9010	1/1	CAXCSE-G0201-C002

Module adapter Legrand Galea, 2 Ports

Description	Units per Delivery	Order Number
Module adapter for Legrand Galea universal housing 60 x 32 mm, for installation of two LANscape® modules		
high-grade steel	1/1	CAXCSE-U0200-C001

Installation variant

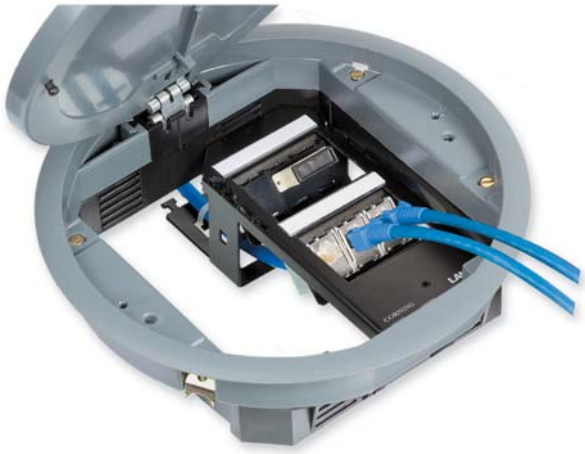
Bill of materials

- Module adapter Legrand Galea, 2P
  1 x CAXCSE-U0200-C001
- S10^{TEN} Module
  1 x CAXTSM-00112-C001
- S250 Module
  1 x CAXESM-00100-C001

Floor box solutions

Application

The LANscape® mounting panels for floor boxes are suitable for all fibre optic and copper modules.



Description

The modular system provides floor box solutions up to nine ports for floor boxes manufactured by Ackermann, Kleinhuis, Electraplan, VanGeel, OBO Bettermann and Vergokan.
The cable strain relief is fixable in different positions.
Self-adhesive designation strips are available for all ports.
Splicing of pigtails is possible in the floor box in combination with the protection box and a special splice tray.

Features

- Suitable for all LANscape modules (FO and Copper)
- Robust metal construction, black
- No additional mounting insert required
- Integrated individual strain relief for each cable (regardless of the diameter)
- Strain relief mountable in various positions
- No screwing required
- Integrated grounding bolt and tab
- Designation window
- Upgradeable with protection box for fibre optic cabling
- Upgradeable with special splice trays

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GES 2, GES 4, GES 4/10, GESR 4, GES 6, GES 6/10, GESR 7/10 (outer) or GES 8/10, for the installation of 6 LANscape modules, with integrated cable strain relief and six cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00600-C013

Floor box solutions

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GESR 7/10 (centre), GES 9 or GESR 9, for the installation of 9 LANscape® modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C013

Mounting Panels for Electraplan Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Electraplan Floor Box KDR Q3 and KDR Q3R (left, centre, right), for the installation of 9 LANscape modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C014

Mounting Panels for VanGeel Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for VanGeel Floor Box IK-1 (long), for the installation of 9 LANscape modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C015

Floor box solutions

Mounting Panels for Vergokan Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Vergokan Floor Box KDSVV (left, centre, right), for the installation of 9 LANscape® modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C016

Mounting Panels for OBO Bettermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for OBO Bettermann Floor Box GE 12 R/5, GE 12 R/10, GE12 RK/5, GE 12 RK/10, for the installation of 9 LANscape modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C017

Mounting Panels for Kleinhuis Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Kleinhuis Floor Box GR. II and GR. III (outside only), for the installation of 9 LANscape modules, with integrated cable strain relief and nine cable ties, designation window, metal construction		
black, RAL 9005	1/1	WAXWSU-00900-C012

Floor box solutions

Protection Boxes for Floor Box Mounting Panels

- Especially suitable for protection of fibre connections in floor boxes
- Robust metal construction, black
- Allows splicing in floor boxes with special splice tray

Description	Units per Delivery	Order Number
Protection Box for Ackermann Floor Boxes (GES 2, GES 4,GES 4/10, GESR4, GES 6, GES 6/10, GESR 7/10 (only outer mounting position) or GES 8/10, with integrated cable management, metal		
black, RAL 9005	1/1	WAXWSU-00000-C013

Description	Units per Delivery	Order Number
Protection Box for Ackermann Floor Boxes GESR 7/10 (only centre position), GES 9 or GESR 9, Kleinhuis Gr. II or Gr. III (only outer mounting position in round boxes), Elektroplan KDR Q3 or KDR R3 (left, centre, right), VanGeel (IK-1 long), Vergokan KDSVV (left, centre, right) and OBO Bettermann GE12 R1S, GE 12 R/10, GE 12 RK/5 or GE 12 RK/10 (left, centre, right), with integrated cable management, metal		
black, RAL 9005	1/1	WAXWSU-00000-C014

Floor box solutions

Splice Trays for Floor Box Mounting Panels

- Suitable for storaging up to 12 splice connections
- Robust metal construction, black
- Cable strain relief for incomming fibre optic cable

Description	Units per Delivery	Order Number
Splice Tray for Protection Box WAXWSU-00000-C013 (Ackermann GES 2, GES 4, GES 4/10, GESR 4, GES 6, GES 6/10, GESR 7/10, outer mounting position only, or GES 8/10)), with splice organiser for the storage of 12 crimp-splice protectors, metal		
black, RAL 9005	1/1	WAXLSU-00000-C005

Description	Units per Delivery	Order Number
Splice Tray for Protection Box WAXWSU-00000-C014 (Ackermann Floor Boxes GESR 7/10 (only centre position), GES 9 or GESR 9, Kleinhuis Gr. II or Gr. III (only outer mounting position in round boxes), Elektroplan KDR Q3 or KDR R3 (left, centre, right), VanGeel (IK-1 long), Vergokan KDSVV (left, centre, right) and OBO Bettermann GE12 R1S, GE 12 R/10, GE 12 RK/5 or GE 12 RK/10 (left, centre, right)), with splice organiser for the storage of 12 crimp-splice protectors, metal		
black, RAL 9005	1/1	WAXLSU-00000-C006

Floor box solutions

Mounting Panel for Ackermann Floor Box GESR2

- Suitable for all LANscape® modules (FO and Copper)
- Robust metal construction, high-grade steel
- No additional mounting insert required

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GESR 2, for installation of one LANscape module, with grounding flap, metal		
high-grade steel	1/1	WAXWSU-00100-C001

Installation variant

Bill of materials

- Mounting Panel for Ackermann Floor Box GESR2
  1 x WAXWSU-00100-C001
- S1200 Module
  1 x CAXFSM-00100-C001
- S1200 Module Adapter
  1 x CAXFSN-00110-C001

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GES 2, GES 4, GES 4/10, GESR 4, GES 6, GES 6/10, GESR 7/10 (outer) or GES 8/10, for the installation of 6 LANscape modules, metal construction		
high-grade steel	1/1	WAXWSU-00600-C004

Floor box solutions

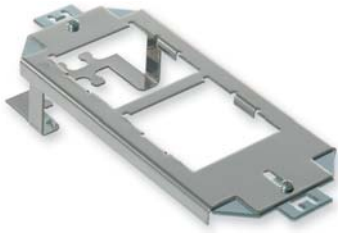
Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GESR 7/10 (centre), GES 9 or GESR 9, for the installation of 9 LANscape® modules, metal construction		
high-grade steel	1/1	WAXWSU-00900-C001

Features

- Suitable for all LANscape modules (FO and Copper) in universal housing WAXWSE-V0201-C002
- Robust metal construction, high-grade steel
- No additional mounting insert required
- Integrated individual strain relief for each cable (regardless of the diameter)
- Rapid installation by snapping the module housings into the mounting panel
- No screwing required

Mounting Panels for Ackermann Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GES 2, GES 4, GES 4/10, GESR 4, GES 6, GES 6/10, GESR 7/10 outer) or GES 8/10, for the installation of 2 LANscape housings (WAXWSE-V0201-C002 or CAXCSE-V0201-C001), integrated strain relief, metal construction		
high-grade steel	1/1	WAXWSU-00400-C001



Description	Units per Delivery	Order Number
Mounting Panel for Ackermann Floor Boxes GESR 7/10 (centre), GES 9 or GESR 9, for the installation of 3 LANscape housings (WAXWSE-V0201-C002 or CAXCSE-V0201-C001), integrated strain relief, metal construction		
high-grade steel	1/1	WAXWSU-00600-C001

Floor box solutions

Mounting Panels for Kleinhuis Floor Boxes

Description	Units per Delivery	Order Number
Mounting Panel for Kleinhuis Floor Boxes GR. II/III, for the installation of 3 LANscape® housings (WAXWSE-V0201-C002 or CAXCSE-V0201-C001), integrated strain relief, metal construction		
high-grade steel	1/1	WAXWSU-00600-C002

Installation variant

Bill of materials

- Mounting panel Kleinhuis GR. II/III (3x2 LANscape)
  1 x WAXWSU-00600-C002
- Blank Cover for Floor Box Mounting panel
  1 x WAXWSU-00000-C001
- Universal Housing, inclined, projecting, 2P
  1 x CAXCSE-V0201-C001
- S100^{eL} Module
  2 x CAXGSM-00100-C001
- S/FTPfx,Cat.6,gn,2xRJ45,4P,3m
  1 x CCAEGB-G4002-A030-C0

Blank Cover for Floor Box Mounting panel

Description	Units per Delivery	Order Number
Blank Cover Panel for unused mounting positions, suitable for Ackermann and Kleinhuis mounting panels, metal		
high-grade steel	1/1	WAXWSU-00000-C001

Patch Panels and Accessories

Features

- Suitable for all LANscape® modules (FO and Copper)
- Robust metal construction, high-grade steel
- For Patch Panel accessories see page 209

Patch Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
19“ Patch Panel, for up to 24 LANscape fibre optic or FutureCom™ copper modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	WAXWSV-02400-C001

Patch Panel Frame 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
19“ Patch Panel Frame, for max. 24 LANscape fibre optic or FutureCom copper modules, 1 U		
high-grade steel	1/1	WAXWSV-02400-C002

Patch Panel 10“, 1U, high-grade steel

Description	Units per Delivery	Order Number
10“ Patch Panel, for up to 12 LANscape fibre optic or FutureCom copper modules, with integrated cable strain relief, 1 U		
high-grade steel	1/1	WAXWSV-01200-C001

Patch Panels and Accessories

Patch Panel 19“, 3U, high-grade steel

Description	Units per Delivery	Order Number
19“ Patch Panel, for up to 48 LANscape® fibre optic or FutureCom™ copper modules, with integrated cable strain relief, 3 U		
high-grade steel	1/1	WAXWSV-04800-C001

Blank Panel 19“, high-grade steel

Description	Units per Delivery	Order Number
Blank Panel 19“, to fill unused areas in distribution cabinets or racks, high-grade steel		
1 U	1/1	WAXWSW-00000-C004
2 U	1/1	WAXWSW-00000-C005

Cable Management Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
19“ Cable Management Panel, panel with 5 black cable management brackets, 1 U		
high-grade steel	1/1	WAXWSW-00000-C007

Patch Panels and Accessories

Cable Feedthrough Panel 19“, 1 U, high-grade steel

Description	Units per Delivery	Order Number
8 edthrough Panel, for feeding the cables into the cabinet interior or rack, incl. edge		
high-grade steel	1/1	WAXWSW-00000-C008

Patch Panel 19“, 1 U, black

Description	Units per Delivery	Order Number
19“ Patch Panel, for up to 24 LANscape® fibre optic or FutureCom™ copper modules, with integrated cable strain relief, 1 U		
black	1/1	WAXWSV-02408-C001

Patch Panel Frame 19“, 1 U, black

Description	Units per Delivery	Order Number
19“ Patch Panel Frame, for max. 24 LANscape fibre optic or FutureCom copper modules, 1 U		
black	1/1	WAXWSV-02408-C002

Patch Panels and Accessories

Blank Panel 19“, black

Description	Units per Delivery	Order Number
Blank Panel 19“, to fill unused areas in distribution cabinets or racks, black		
1 U	1/1	WAXWSW-00008-C004
2 U	1/1	WAXWSW-00008-C005

Cable Management Panel 19“, 1 U, black

Description	Units per Delivery	Order Number
19“ Cable Management Panel, panel with 5 black cable management brackets, 1 U		
black	1/1	WAXWSW-00008-C007

Cable Feedthrough Panel 19“, 1 U

Description	Units per Delivery	Order Number
19“ Cable Feedthrough Panel, for feeding the cables into the cabinet interior or rack, incl. edge grommeting, 1U		
black	1/1	WAXWSW-00008-C008

Patch Panels and Accessories

Features

- Retrofit solution
- Suitable for FutureCom™ and LANscape® Patch Panels

Designation Labels for Patch Panels

Description	Units per Delivery	Order Number
440 mm Designation Window, self-adhesive for LANscape patch panels		
transparent	10/1	WAXWSW-00000-C002

Designation Label Sheet DIN A4

Description	Units per Delivery	Order Number
DIN A4 Designation Label Sheet, with 20 designation strips for LANscape patch panels		
white	10/1	WAXWSW-00000-C003

Dust Protection Plug

Description	Units per Delivery	Order Number
Dust protection plug for RJ45 modules		
grey	100/1	TKE:1304010

FutureCom™ Hardware

Patch Panels and Accessories

Application

The LANscape® 10“ consolidation point housing is universally applicable for ceiling, wall, false floor or desk mounting. This concept permits a free user-specific configuration of building, floor and office distributors.

Features

- Full metal housing for the installation of up to 12 LANscape modules
- Standard-compatible according to ISO/IEC 11801 (2002) and EN 50173-1 (2003)
- Easy installation for a distribution or consolidation point
- Consolidation Point Housing is suitable for ceiling, wall, false floor or desk assembly
- Individual strain relief for the incoming and outgoing cable sections via cable ties
- Dust-proof feedthrough for incoming cable
- Easy plug-in of consolidation point cable (dust protection and mechanical protection)
- Housing base electrically conductive for optimal shielding transition or grounding
- Installation height of 60 mm
- Housing is fastened using special non-detachable screws
- Black sheet steel housing top, RAL 9005

Description	Units per Delivery	Order Number
Consolidation Point Housing for max. 12 LANscape modules, with strain relief for incoming data cables, patch cord strain relief and dust protection flap for floor, wall and ceiling installation, 60 x 263 x 320 mm (HxWxD)		
black	1/1	WAXWSW-00008-C015

Patch Panels and Accessories

Application

The LANscape® 19“ consolidation point housing is universally applicable for ceiling, wall, false floor or desk mounting. This concept permits a free user-specific configuration of building, floor and office distributors.

Features

- Full metal housing for LANscape and FutureCom F patch panels
- Standard-compatible according to ISO/IEC 11801 (2002) and EN 50173-1 (2003)
- Easy installation for a distribution or consolidation point
- Consolidation Point Housing is suitable for ceiling, wall, false floor or desk assembly
- Individual strain relief for the incoming and outgoing cable sections via cable ties
- Dust-proof feedthrough for incoming cable
- Easy plug-in of consolidation point cable (dust protection and mechanical protection)
- Housing base electrically conductive for optimal shielding transition or grounding
- Installation height of 60 mm
- Housing is fastened using special non-detachable screws
- Black sheet steel housing top, RAL 9005

Description	Units per Delivery	Order Number
Consolidation Point Housing for LANscape and FutureCom™ patch panels, with strain relief for incoming data cables, patch cord strain relief and dust protection flap for floor, wall and ceiling installation, 60 x 493 x 301 mm (HxWxD)		
black	1/1	WAXWSW-00008-C013

9 FutureCom™ Telephone / ISDN Products

9.1. Cat. 3 / ISDN Patch Panels 214

9.2. Cat. 3 / ISDN Patch Cords 217

Cat. 3 / ISDN Patch Panels

Application

The FutureCom™ Cat.3 / ISDN telephone patch panel offers a simple and economical way to connect the telephone system or the telephone backbone with the structured wiring.
The telephone connection can be made by one or two pairs (analogue and ISDN technology)

Features

- 19“ patch panel, 1U with 50 unshielded 8-pin RJ45 jacks
- Wire connection via 4-pin LSA/110 connect dual cutting clamps for AWG 22-26
- Wiring according to ISO/IEC 11801/EN 50173-1, configuration: Pin 3/6 and Pin 4/5
- Grounding via M6 screw with nut and lock washer in the patch panel
- Shield connection directly on the circuit board
- Integrated cable strain relief

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 50x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 1 U		
high-grade steel	1/1	CAXCSV-05000-C001

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 50x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 1 U		
light grey	1/1	CAXCSV-05003-C001

Cat. 3 / ISDN Patch Panels

Application

The FutureCom™ Cat.3 / ISDN telephone patch panel offers a simple and economical way to connect the telephone system or the telephone backbone with the structured wiring.
The telephone connection can be made by one or two pairs (analogue and ISDN technology)

Features

- 19“ patch panel, 1 U with 25 unshielded RJ45 jacks
- Wire connection via 4-pin LSA/110 connect dual cutting clamps for AWG 22-26
- Wiring according to ISO/IEC 11801/EN 50173-1, configuration: Pin 3/6 and Pin 4/5
- Grounding via M6 screw with nut and lock washer in the patch panel
- Shield connection directly on the circuit board
- Integrated cable strain relief

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 25x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 1 U		
high-grade steel	1/1	CAXCSV-02500-C001

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 25x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 1 U		
light grey	1/1	CAXCSV-02503-C001

Cat. 3 / ISDN Patch Panels

Application

The FutureCom™ Cat.3 / ISDN telephone patch panel offers a simple and economical way to connect the telephone system or the telephone backbone with the structured wiring.
The telephone connection can be made by one or two pairs (analogue and ISDN technology)

Features

- 19“ patch panel, 0.5 U with 25 unshielded RJ45 jacks
- Wire connection via 4-pin LSA/110 connect dual cutting clamps for AWG 22-26
- Wiring according to ISO/IEC 11801/EN 50173-1, configuration: Pin 3/6 and Pin 4/5
- Grounding via M6 screw with nut and lock washer in the patch panel
- Shield connection directly on the circuit board
- Integrated cable strain relief

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 25x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 0.5 U		
high-grade steel	1/1	CAXCSV-02500-C002

Description	Units per Delivery	Order Number
FutureCom Cat. 3 / ISDN Telephone Patch Panel, unshielded, 25x RJ45, configuration 4.5 and 3.6, LSA-PLUS, 0.5 U		
light grey	1/1	CAXCSV-02503-C002

Cat. 3 / ISDN Patch Cords, RJ45 - RJ45

Application

The FutureCom™ Cat.3 / ISDN U/UTP flex/27 patch cords are used for connecting existing networks or active components with RJ45 interface. They are suitable for analogue as well as digital signal transmission, e.g. for telephony.

Description

The FutureCom Cat.3 / ISDN U/UTP flex/27 patch cords patch cords are assembled with one unshielded RJ45 connector according to IEC 60603-7 at each end.

They are available in various lengths.

Features

- RJ45 connector pin-out: 4,5/3,6 (ISDN, So, Upo, U200, U*, U2B1Q, analogue a/b, a/b/c/d)
- Category 3
- Wire insulation: Polypropylene
- Outer jacket: Flame retardant PVC

Telephone Patch Cords U/UTP flex, ISDN / Analogue

Length	black
0.5 m	CCACOC-A6002-A005-C0
1 m	CCACOC-A6002-A010-C0
2 m	CCACOC-A6002-A020-C0
3 m	CCACOC-A6002-A030-C0
5 m	CCACOC-A6002-A050-C0
10 m	CCACOC-A6002-A100-C0

Other lengths upon request

10 FutureCom™ Industrial

10.1. Ethernet - One Network for all Departments 220

10.2. Standards and Categorisations 221

10.3. Cables

10.3.1. S/FTP 800/23 PUR 224

10.3.2. S/FTP 600 flex/26 PUR 226

10.4. Hardware

10.4.1. IP67/65 Outlet 228

10.4.2. IP67/65 Patch Cords 230

10.4.3. Metal Outlets 232

10.4.4. Top hat rail module / adapter 241

Ethernet - One Network for all Departments

In worldwide communication Ethernet has prevailed to a uniform, multi-supplying transmission protocol in the office environment and is standardized in IEEE 802.3. After this resounding success, structured cabling defined by international standards is now entering the industrial environment. The local area network (LAN) of an industrial enterprise can be split into the following divisions:

- Office environment
- Production hall
- Machinery

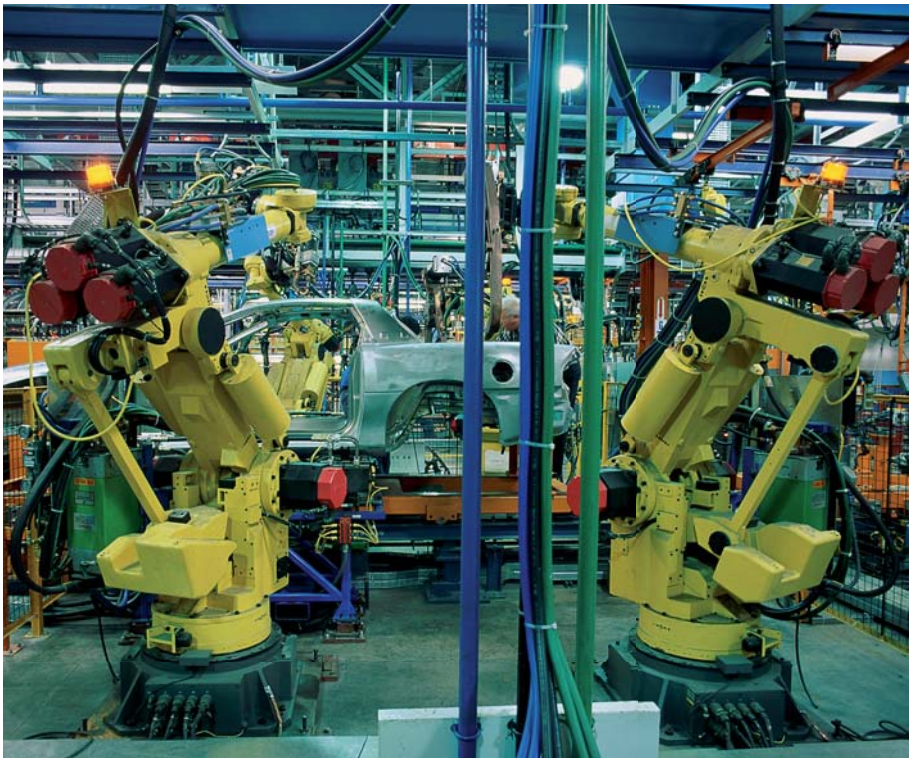
Industrial Ethernet

Due to companies usually already having Ethernet-LAN for linking their offices, Industrial Ethernet devices, which are neccessary for controlling and monitoring production processes, can be easily integrated. As a result, enormous rationalization is possible in all divisions, with numerous advantages for the whole company:

- Ethernet-LAN provides a standardized continuous communication to all company divisions
- Uniform infrastructure is possible without interfaces from either office or machinery to the sensor
- Process- and production data are not only available at the fieldbus level, but also pass into cross-departmental data acquisition systems
- Remote diagnosis and remote maintenance for machinery and plants

Fields of Application

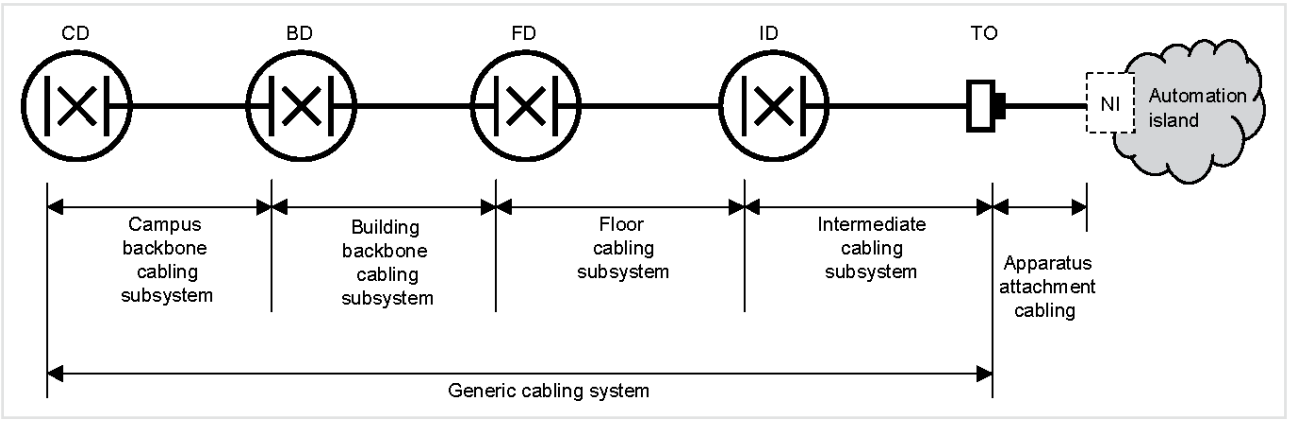
- Wiring of Infrastructure
- Machinery Control
- Robot Control
- Automobile Industry
- Building Automation
- Medicine, Pharmaceuticals
- Chemical Industry
- Industrial Scales, Measurement devices
- Cameras, Monitors
- Power Plants
- Mining
- Military
- Transportation



Standards and Categorisations

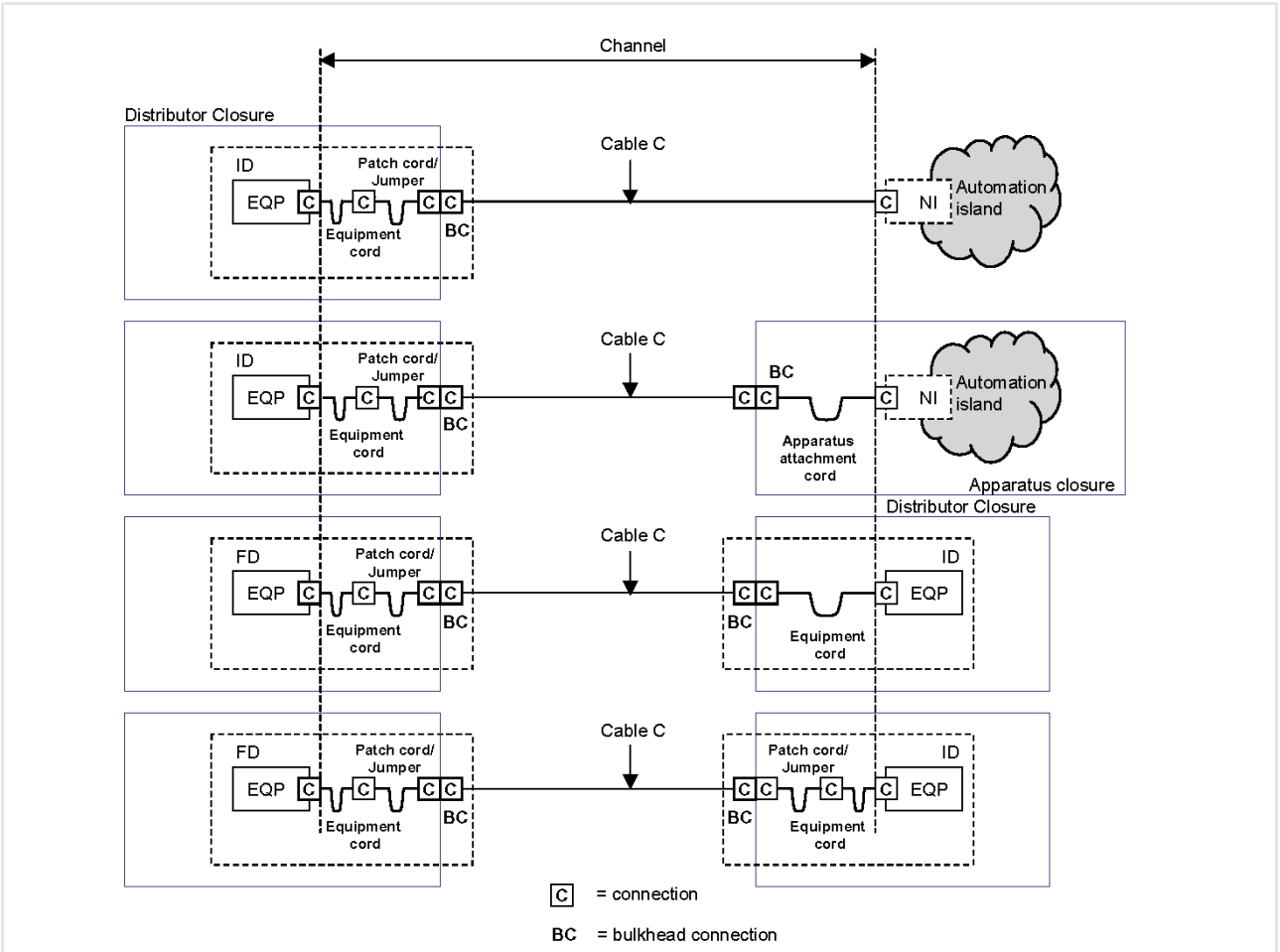
The structured cabling in the office area is specified by ISO/IEC 11801 (2002) and EN 50173-1 (2003). For the industrial sector a corresponding standard, named ISO/IEC 24702 "Information technology - Generic cabling - Industrial premises", was elaborated by ISO/IEC. In Europe it is specified in EN 50173-3.
Besides channel performance, special requirements in mechanical capacity, ingress rating, increased climatic requirements and EMC-property are defined (MICE).

Structure of generic cabling for industrial environments according to ISO/IEC 24702



CD: Campus Distributor BD: Building Distributor FD: Floor Distributor ID: Intermediate Distributor TO: Telecommunications Outlet

Possible channel configuration according to ISO/IEC 24702



Standards and Categorisations

Classification of environmental influences (MICE) according to ISO/IEC 24702

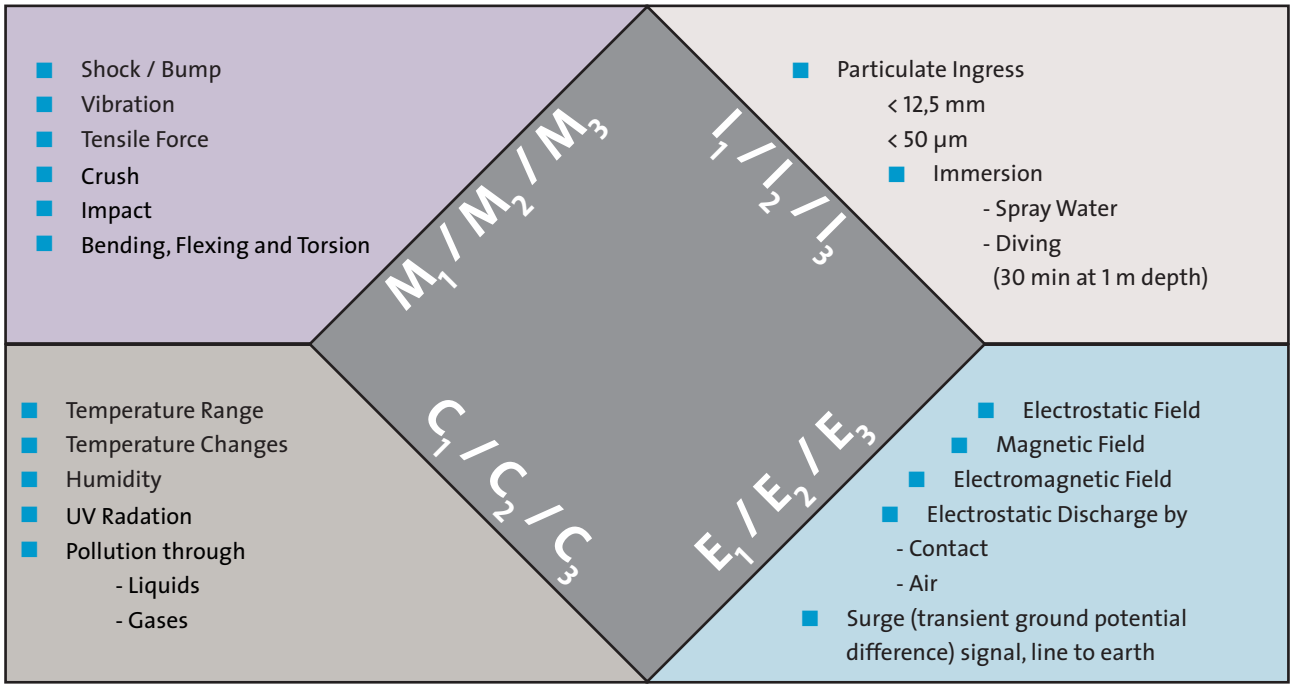
For Industrial Ethernet active and passive components need to be specially adapted to the environmental requirements of the industry. Particularly relevant are the fixing on top hat rails (DIN rail), an extended operating temperature range, a hightened IP protection level (protection against dust, splash water, etc.), vibration resistance and even special dispositions for reliability.

Requirements / Class	1	2	3
Mechanical	M_1	M_2	M_3
Ingress	I_1	I_2	I_3
Climatic	C_1	C_2	C_3
Electromagnetic	E_1	E_2	E_3

- $M_1I_1C_1E_1$ describes a worst case in office environments (according to ISO/IEC 11801)
- $M_2I_2C_2E_2$ describes a worst case in light industrial environments
- $M_3I_3C_3E_3$ describes a worst case in industrial environments
- The requirements increase by ascending level, all combinations are possible e.g. $M_1I_2C_3E_1$

Requirements of the environments

The products will be classified corresponding to their properties according to ISO/IEC 24702 per achievement level (Mechanic, Ingress, Climatic and Electromagnetic) into groups, one to three. The FutureCom Industrial IP67 outlet, for example, is specified as $M_3I_3C_3E_3$ product.



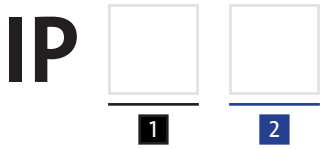
Standards and Categorisations

IP Protection Classes

Industrial systems are exposed to higher strains compared to active and passive components used in office areas. The ingress of moisture and dust has to be prevented to grant reliable functionality. Heightened charging by dust, dirt, oil etc. has to be visualized in the production areas. Furthermore the equipment has to withstand cleaning by water (high pressure washer) or other detergent, e.g. in the food industry.

In the development and manufacturing of Industrial Ethernet components, particular attention has to be paid to adherence to the IP protection classes (IP = International Protection). These outline the level of environmental stress a system can be exposed to, in terms of both contiguity and protection against contaminant and moisture, without suffering damage. The IP protection classes are defined in DIN EN 60529.

The IP code typically consists of a double-digit number-combination which outlines the particular degree of protection, e.g. IP67. The first digit specifies the protection class of contiguity and protection against contaminant, the second digit shows the protection class of protection against water and moisture.



1 Degree of Protection of contiguity and protection against contaminant

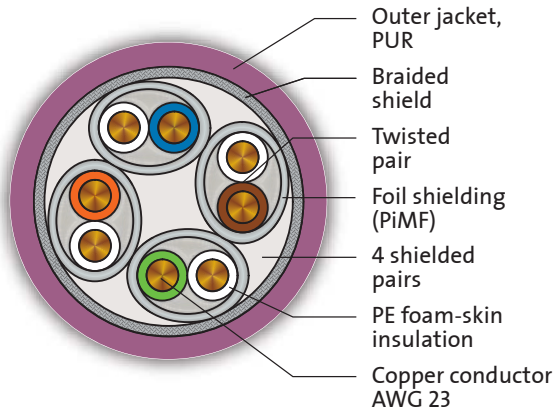
0	No contiguity and protection against contaminant
1	Protection against large-scale fragments and large-sized contaminants (diameter > 50 mm)
2	Finger protection and protection against medium-sized contaminants (diameter > 12.5 mm)
3	Protection against small contaminants, such as tools and wires (diameter > 2.5 mm)
4	Protection against granular contaminants, such as tools and wires (diameter > 1 mm)
5	Complete contiguity and protection against dust deposits inside
6	Complete contiguity and protection against dust entering

2 Degree of Protection against moisture / water

0	No protection against moisture
1	Protection against perpendicular falling water drops, e.g. condensation
2	Protection against askew falling water drops (inclination to 15° towards perpendicular)
3	Protection against direct spray water (inclination to 60° towards perpendicular)
4	Protection against all sides spray water
5	Protection against hose water from all sides
6	Protection against strong hose water (temporary inundation)
7	Protection against occasional submergence (down to 1 m depth)

FutureCom™ Industrial

S/FTP 800/23 PUR, Cat. 7 Cables



Application

The FutureCom™ Industrial S/FTP 800/23 cable with polyurethane jacket is particularly suitable for industrial applications. It is recommended in conjunction with FutureCom metal outlets for industrial networks. This cable is designed for aplications up to 800 MHz and his transmission characteristic exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 800/23 PUR cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame resistant and non-corrosive
- Resistant against mineral and cooling lubricant
- Aromitic hydocarbon resistant
- Resistant against weak mineral acids and organic acids and bases
- Microbe- and hydrolysis resistant

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Polyurethane (PUR)
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥23 mm
Min. bending radius during installation	≥60 mm
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

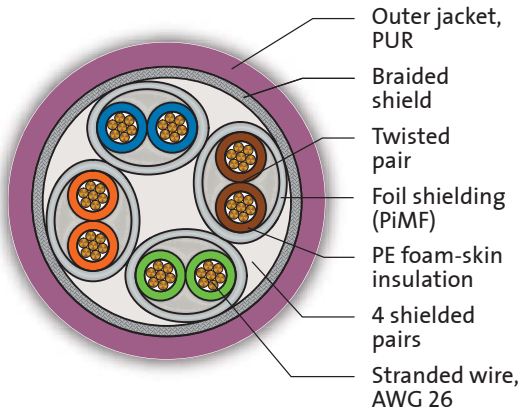
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 800/23 4P, PUR	7	4	0.74	Yes	purple	154	7.7	64	1000	**CCXIPB-F0047-C001-L7**

FutureCom™ Industrial

S/FTP 600 flex/26 PUR, Cat. 7 Cables



Application

The FutureCom™ Industrial S/FTP 600 flex/26 cable with polyurethane jacket is specially designed for industrial use. This cable is specified up to 600 MHz and provides transmission performance meeting Category 7 cable specifications EN 50288-4-2 and IEC 61156-5.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Additional features are the slim design and low weight of the cable.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 600 flex/26 PUR cable, specified up to 600 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame resistant and non-corrosive
- Resistant against mineral and cooling lubricant
- Aromitic hydocarbon resistant
- Resistant against weak mineral acids and organic acids and bases
- Microbe- and hydrolysis resistant
- Suitable for IDC contacting
- Unprinted

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Polyurethane (PUR)
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥18 mm
Min. bending radius during installation	≥40 mm
Copper conductor	AWG 26

Electrical characteristics (at 20°C)

Largest resistance margin	2 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Mutual capacity	43 pF/m
Propagation velocity at >10 MHz (NVP*c)	0.78 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**20**	**31.25**	**62.5**	**100**	**300**	**600**
Attenuation according to standard [dB/100 m]*	2.9	8.5	12.1	15.2	21.7	27.8	50.0	73.3
Typical attenuation [dB/100 m]	**2.9**	**7.9**	**10.8**	**13.5**	**19.5**	**25.2**	**44.3**	**63.5**
NEXT according to standard [dB/100 m]*	80	80	80	80	75.1	72.4	65.3	60.8
Typical NEXT values [dB/100 m]	**96.0**	**96.0**	**96.0**	**96.0**	**95.0**	**94.0**	**86.0**	**80.0**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	72.5	69.4	62.3	57.8
Typical PSNEXT values [dB/100 m]	**93.0**	**93.0**	**93.0**	**93.0**	**92.0**	**91.0**	**83.0**	**77.0**
ELFEXT according to standard [dB/100 m]*	80	74	68	64.1	58.1	54	44.5	38.4
Typical ELFEXT values [dB/100 m]	**95.0**	**93**	**93**	**88.0**	**81.0**	**72.0**	**60.**	**51.0**
PSELFEXT according to standard [dB/100 m]*	77	71	65	61.1	55.1	51.0	41.5	35.4
Typical PSELFEXT values [dB/100 m]	**92.0**	**90**	**90**	**85.0**	**78.0**	**69.0**	**57.0**	**48.0**
ACR according to standard [dB/100 m]*	77.1	71.5	67.9	64.8	53.4	44.6	15.3	-
Typical ACR values [dB/100 m]	**93.1**	**88.1**	**85.2**	**82.5**	**75.5**	**68.8**	**47.7**	**16.5**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-2)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 600 flex/26, PUR	7	4	0.43	Yes	purple	5.8	42	1000	**CCXIHB-G0047-0007-H2**

FutureCom™ Industrial

IP67/65 Outlet

Application

The FutureCom™ Industrial IP67/65 outlet with integrated cable guide and cable strain relief is supplied with two FutureCom S250 modules. FutureCom S10^{TEN}e, S10^{TEN}, S100^{eL} or S100^{e} modules can also be installed in the outlet as required.
The surface-mount outlet is suitable for installing RJ45 Industrial Ethernet connections in areas with extreme environmental conditions as a result of temperature, dust, moisture or hose water.

Features

- For use directly in the production environment of the automobile industry, food industry, and other areas of industry that require IP67 protection rating and prefer to use PROFInet®-compliant cabling (PROFInet is the Industrial Ethernet standard for automation technology)
- For use in workshops, assembly shops and laboratories where, for instance, hose water is used for cleaning purposes (IP65 protection rating)
- Areas with extra high security requirements with regard to access protection
- RJ45 cabling in warehouses and centres for transport and logistics that utilise PROFInet-compliant connections to guarantee compatibility with the entire system and meet high security requirements
- PROFInet-compliant RJ45 interface based on a push-pull interface makes it easy to integrate in a PROFInet-based control and automation environment
- Fully compatible with HARTING PushPull (recommended by the PROFInet user organisation PNO)
- Space-saving push-pull mating pattern makes it incredibly easy to handle IP67/65 push-pull RJ45 connectors (even when wearing gloves)
- Two-port design of FutureCom Industrial outlet allows maintenance and diagnostics to be performed during operation
- Permanent labelling for each connection thanks to integrated waterproof labeling field in cover
- Robust protection of RJ45 connections from mechanical damage and hose water even when unconnected, thanks to automatic shutters (IP67/65 protection rating)
- Optional seal provides robust access protection for each port
- Comprehensive use of FutureCom S250 modules in the entire network allows for unified system acceptance test according to category 6, link class E

IP67/65 Outlet

Description	Units per Delivery	Order Number
FutureCom™ Industrial IP67/65 outlet, 2 x RJ45, incl. two FutureCom S250 modules, category 6, shielded, with waterproof labelling window and self-closing protective door for RJ45, Corning logo, MICE classification: $M_3I_3C_3E_3$		
white, RAL 9010	1/1	CAXISD-U0201-C001

Description	Units per Delivery	Order Number
FutureCom Industrial IP67/65 outlet, 2 x RJ45, incl. two FutureCom S250 modules, category 6, shielded, with waterproof labelling window and self-closing protective door for RJ45, Corning logo, MICE classification: $M_3I_3C_3E_3$		
black	1/1	CAXISD-U0208-C001

FutureCom™ Industrial

IP67/65 Patch Cords, 2x IP67/65

Application

FutureCom™ Industrial S/FTP flex IP67/65 patch cords are specially designed for Ethernet connections in areas with harsh environmental conditions such as humidity, water, dust or extreme temperatures.

Description

The FutureCom Industrial S/FTP flex IP67/65 patch cord are foil and braid shielded (PiMF) and offer a polyurethane jacket for harsh environments.
They are assembled with one industrial RJ45 connector in compliance with IEC 60603-7-4 and IEC 61076-3-106 at each end.

They are available in various lengths.

Features

- high-quality IP67 industrial-RJ45 Cat.6 connector in compliance with IEC 61076-3-106
- Robust connector for harsh environmental conditions such as jet water during cleaning with water hose, extreme temperatures, dust and humitity
- Flame resistant and non-corrosive
- Microbe- and hydrolysis resistant cable
- Cable resistant against mineral and cooling lubricant
- Cable resistant against aromitic hydocarbon
- IP67 protection level according to EN 60529

FutureCom Industrial S/FTP flex patch cords, 2x IP67/65

Length	purple
1 m	CCAIHB-G70H2-A010-C0
2 m	CCAIHB-G70H2-A020-C0
3 m	CCAIHB-G70H2-A030-C0
5 m	CCAIHB-G70H2-A050-C0
10 m	CCAIHB-G70H2-A100-C0

Other lengths upon request

FutureCom™ Industrial

IP67/65 Patch Cords, IP67/65 - RJ45

Application

FutureCom™ Industrial S/FTP flex IP67/65 patch cords are specially designed for Ethernet connections in areas with harsh environmental conditions such as humidity, water, dust or extreme temperatures.

Description

The FutureCom Industrial S/FTP flex IP67/65 patch cord are foil and braid shielded (PiMF) and offer a polyurethane jacket for harsh environments.
They are assembled with one industrial RJ45 connector in compliance with IEC 60603-7-4 and IEC 61076-3-106 and one RJ45 connector at each end.

They are available in various lengths.

Features

- high-quality IP67 industrial-RJ45 Cat.6 connector in compliance with IEC 61076-3-106
- Robust connector for harsh environmental conditions such as jet water during cleaning with water hose, extreme temperatures, dust and humitity
- Flame resistant and non-corrosive
- Microbe- and hydrolysis resistant cable
- Cable resistant against mineral and cooling lubricant
- Cable resistant against aromitic hydocarbon
- IP67 protection level according to EN 60529
- ProfiNET compliant

FutureCom Industrial S/FTP flex patch cords, IP67/65 - RJ45

Length	purple
1 m	CCAIHB-G70H1-A010-C0
2 m	CCAIHB-G70H1-A020-C0
3 m	CCAIHB-G70H1-A030-C0
5 m	CCAIHB-G70H1-A050-C0
10 m	CCAIHB-G70H1-A100-C0

Other lengths upon request

FutureCom™ Industrial

Metal Outlets

Application

The 2-port LANscape® industrial metal outlets with integrated cable strain relief can be equipped with any LANscape fibre optic or copper modules. The outlet is suitable for harsh environmental conditions and can be mounted on a surface, as well as in different positions on top hat rails (35 mm DIN rails).

Features

- Suitable for all kinds of production plants with a required protection level of IP20
- Metal construction suitable for harsh environmental conditions in industrial environments
- Integrated cable strain relief for two individual cables (separate installation possible)
- Cable diameter-independent and dust-protected cable entry
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Horizontal and vertical top hat rail mounting
- Excess length storage for FO cables with max. length of 0.6-1.0 m, maintaining the minimum bending radius
- Standard fastening shape (60 mm hole spacing)

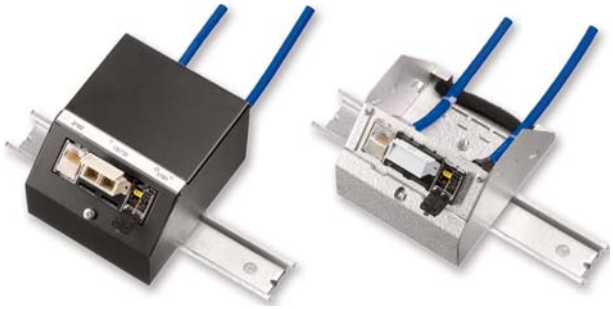
Description	Units per Delivery	Order Number
2-Port Metal Outlet for Industrial Applications, 60 x 65 x 121 mm (HxWxD), for the installation of 2 LANscape modules, inclined, projecting, with designation window, metal construction with integrated cable strain relief		
anthracite, RAL 7016	1/1	WAXWSD-V0208-C001

FutureCom™ Industrial

Metal Outlets

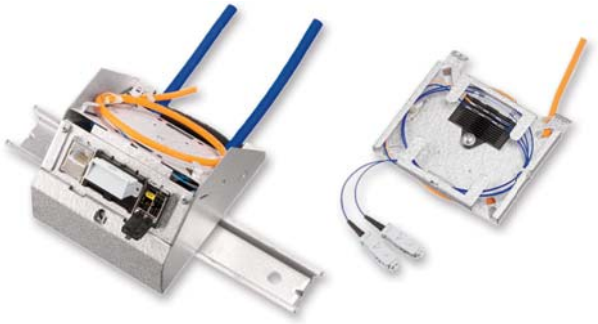
Application

The 4-port LANscape® industrial metal outlets with integrated cable strain relief can be equipped with any LANscape fibre optic or copper modules.
The outlet is suitable for harsh environmental conditions and can be mounted on a surface, as well as on a top hat rail (35 mm DIN rails).



Features

- Integrated cable strain relief for four individual cables (separate installation possible)
- Metal construction suitable for harsh environmental conditions in industrial environments
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Non-detachable designation label
- Cable diameter-independent and dust-protected cable entry
- Integrated grounding bolt and tab
- Horizontal and vertical top hat rail mounting
- Splice holder for 12 crimp-splice connections including excess length storage for FO pigtails and cables, can be retrofitted at any time
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Protection level IP20

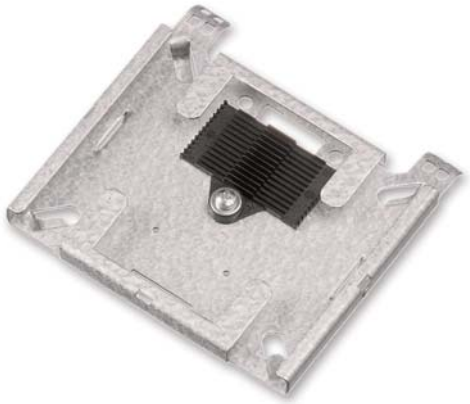


Description	Units per Delivery	Order Number
4-Port Metal Outlet for Industrial Applications, 79 x 101 x 121 mm (HxWxD), for the installation of max. 4 LANscape modules, inclined, with designation window, metal construction with integrated cable strain relief, integrated grounding pin, easy retrofitting of the optional splice tray, WAXLSD-0000-C001,		
anthracite, RAL 7016	1/1	**WAXWSD-V0408-C001**

Metal Outlets

Splice Tray for 4-Port Metal Outlet

Description	Units per Delivery	Order Number
Splice Tray for 4-Port Metal Outlets, 15 x 96 x 92 mm (HxWxD), with splice organiser for 12 crimp-splice connections, separate excess length storage which supports the minimum bending radius requirements for fibre optic pigtails and cables		
silver	1/1	WAXLSD-0000-C001



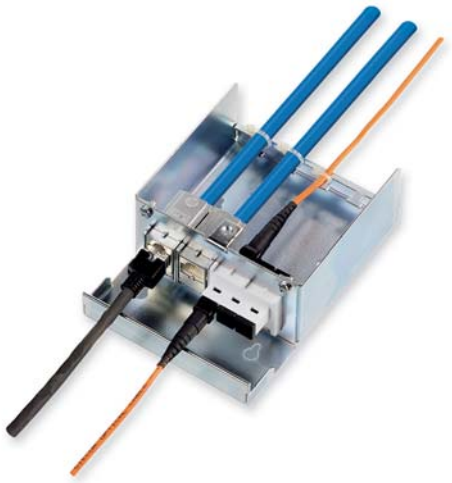
FutureCom™ Industrial

Metal Outlets

Application

The LANscape® metal outlet is constructed entirely from metal and is intended for wall surface mounting or mounting in false floors. A top hat rail installation (35 mm top hat rails) is also possible. It offers space for four simplex modules (FutureCom S1200, S10^{TEN}e, S10^{TEN}, S250, S100^{e} or S100^{eL} copper modules as well as LANscape Modular SC, ST,MT-RJ, LC or E2000 fibre optic modules) or two duplex modules (LANscape Modular SC duplex and MT-RJ triplex fibre optic module).

The outlet is especially designed with security features and therefore suitable for areas with higher security requirements.



Features

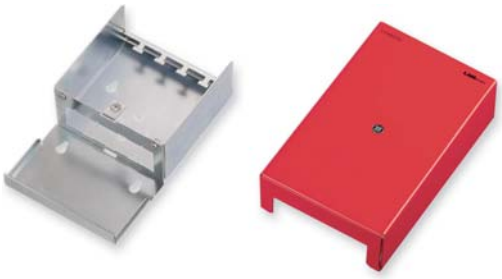
- Suitable for all kinds of production plants with a required protection level of IP20
- Metal construction suitable for harsh environmental conditions in industrial environments
- Connection protection and security against accidental or unauthorised access and for this reason suitable for areas with higher security requirements
- Integrated cable strain relief for four individual cables (separate installation possible)
- Cable diameter-independent and dust-protected cable entry
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Fastening of the housing cover by using a captive central screw (can be protected by a security label)
- Horizontal and vertical top hat rail mounting
- Excess length storage for FO cables with max. length of 0.6-1.0 m, maintaining the minimum bending radius
- Standard fastening shape (60 mm hole spacing)

FutureCom™ Industrial

Metal Outlets

Description	Units per Delivery	Order Number
Metal Outlet, 4-Port, 45 x 93 x 143.5 mm (HxWxD), for the installation of 4 LANscape® modules, straight, metal construction with integrated strain relief, patchcord protection and excess length storage for FO cables		
white, RAL 9010	1/1	WAXWSD-U0401-C001

Description	Units per Delivery	Order Number
Metal Outlet, 4-Port, 45 x 93 x 143.5 mm (HxWxD), for the installation of 4 LANscape modules, straight, metal construction with integrated strain relief, patchcord protection and excess length storage for FO cables		
red, RAL 3000	1/1	WAXWSD-U0407-C001



Description	Units per Delivery	Order Number
Metal Outlet, 4-Port, 45 x 93 x 143.5 mm (HxWxD), for the installation of 4 LANscape modules, straight, metal construction with integrated strain relief, patchcord protection and excess length storage for FO cables		
anthracite, RAL 7016	1/1	WAXWSD-U0408-C001

Metal Outlets

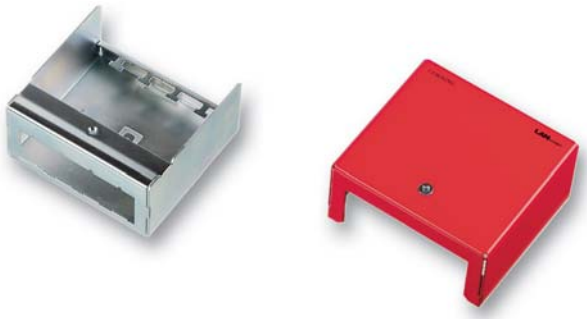
Application

The LANscape® metal outlet is constructed entirely from metal and is intended for wall surface mounting or mounting in false floors. A top hat rail installation (35 mm top hat rails) is also possible. It offers space for four simplex modules (FutureCom S1200, S10^{TEN}e, S10^{TEN}, S250, S100^{e} or S100^{eL} copper modules as well as LANscape Modular SC, ST,MT-RJ, LC or E2000 fibre optic modules) or two duplex modules (LANscape Modular SC duplex and MT-RJ triplex fibre optic module).

Features

- Suitable for all kinds of production plants with a required protection level of IP20
- Metal construction suitable for harsh environmental conditions in industrial environments
- Integrated cable strain relief for four individual cables (separate installation possible)
- Cable diameter-independent and dust-protected cable entry
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Horizontal and vertical top hat rail mounting
- Excess length storage for FO cables with max. length of 0.6-1.0 m, maintaining the minimum bending radius
- Standard fastening shape (60 mm hole spacing)

Description	Units per Delivery	Order Number
Metal Outlet, 4-Port, 45 x 93 x 87 mm (HxWxD), for the installation of 4 LANscape modules, straight, metal construction with integrated strain relief and excess length storage for FO cables		
red, RAL 3000	1/1	WAXWSD-U0407-C002



Metal Outlets

Description	Units per Delivery	Order Number
Metal Outlet, 4-Port, 45 x 93 x 87 mm (HxWxD), for the installation of 4 LANscape® modules, straight, metal construction with integrated strain relief and excess length storage for FO cables		
white, RAL 9010	1/1	WAXWSD-U0401-C002

Top hat rail clip for Metal Outlets

Description	Units per Delivery	Order Number
Top hat rail clip for installation of metal outlets on 35 mm top hat rails, incl. two screws, suitable for vertical and horizontal mounting		
silver	1/1	WAXWSE-00000-C001

Metal Outlets

Application

The 2-port LANscape® industrial metal outlets with integrated cable strain relief can be equipped with two modules. The outlet is suitable for harsh environmental conditions and mounting on ceiling, wall or false floor as well as in different positions on top hat rails (35 mm DIN rails).

Features

- Metal construction suitable for harsh environmental conditions in industrial environments
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Cable diameter-independent and dust-protected cable entry
- Integrated cable strain relief for two individual cables (separate installation possible)
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Horizontal and vertical top hat rail mounting
- Protection level IP20

Description	Units per Delivery	Order Number
2-Port Metal Outlet for Industrial Applications, 60 x 55 x 107 mm (HxWxD), for the installation of max. 2 LANscape modules, inclined, integrated cable strain relief and grounding latch		
black, RAL 9005	1/1	WAXWSD-V0208-C002

Description	Units per Delivery	Order Number
2-Port Metal Outlet for Industrial Applications, 60 x 55 x 107 mm (HxWxD), for the installation of max. 2 FutureCom S1200 modules, inclined, integrated cable strain relief and grounding latch		
black, RAL 9005	1/1	CAXFSD-V0208-C002

FutureCom™ Industrial

Metal Outlets

Application

The 4-port LANscape® industrial metal outlets with integrated cable strain relief can be equipped with four modules. The outlet is suitable for harsh environmental conditions and mounting on ceiling, wall or false floor as well as in different positions on top hat rails (35 mm DIN rails).

Features

- Metal construction suitable for harsh environmental conditions in industrial environments
- Conductive housing for optimised grounding of shielded FutureCom™ modules
- Cable diameter-independent and dust-protected cable entry
- Integrated cable strain relief for four individual cables (separate installation possible)
- Retrofitting and re-equipping without complete disassembly due to the two-part housing
- Horizontal and vertical top hat rail mounting
- Protection level IP20

Description	Units per Delivery	Order Number
4-Port Metal Outlet for Industrial Applications, 60 x 91 x 107 mm (HxWxD), for the installation of max. 4 LANscape modules, inclined, integrated cable strain relief and grounding latch		
black, RAL 9005	1/1	WAXWSD-V0408-C002

Description	Units per Delivery	Order Number
4-Port Metal Outlet for Industrial Applications, 60 x 91 x 107 mm (HxWxD), for the installation of max. 4 FutureCom S1200 modules, inclined, integrated cable strain relief and grounding latch		
black, RAL 9005	1/1	CAXFSD-V0408-C002

FutureCom™ Industrial

Top hat rail module / adapter

Application

The FutureCom™ Industrial top hat rail adapter is suitable for installation on 35 mm top hat rails.
He provides a potential equalisation spring and allows due to his modular design a free configuration of each single port with FutureCom copper modules as well as LANscape® fibre optic modules.

Features

- Compact design with small dimensions
- Electrical spring contact to top hat rail (bonding, grounding)
- Inclined design with labeling field and dust protection flap
- Tool-less and fast installation on top hat rails
- Tool-less installation of module
- Top hat rail adapter light grey, RAL 7035
- Flame retardant, fire Class UL94 V-0
- Temperature range: -20°C to +70°C
- Recyclable and free of heavy metal

Description	Units per Delivery	Order Number
FutureCom™ Industrial top hat rail module, incl. one S250 module, 1x RJ45, Cat. 6, shielded, incl. potential equalisation spring, for mounting on 35 mm top hat rails, designation window and dust protection flap		
light grey	1/1	CAXISD-V0103-C001

Description	Units per Delivery	Order Number
FutureCom Industrial top hat rail adapter, 1 port, for installation of one FutureCom copper or LANscape fibre optic module, incl. potential equalisation spring, for mounting on 35 mm top hat rails, designation window and dust protection flap		
light grey	1/1	WAXISE-V0103-C001

11 Media Converter Module

11.1. System Overview 244

11.2. MCM Hardware 245

Media Converter Module

System Overview

The Plug & Play™ Universal Systems Media Converter Module (MCM) is a value-added complement to the high density pre-terminated fibre optic cabling system pioneered by Corning Cable Systems. The Media Converter Module provides connectivity between a structured copper cabling and fibre optic cabling.

Two Media Converter Modules can be placed in the 1U housing (24-port capacity), and the 4U housing can hold up to eight Media Converter Modules (96-port capacity). And because the housings are part of the Pretium™ Hardware line, all Plug & Play Universal Systems components are compatible with the Media Converter Housings.

The Media Converter Modules are powered by redundant power supplies. An optional remote management module for the power supplies is also available that alerts network managers to a power supply failure or fan fault.

Since the Media Converter Module shares the same footprint as the optical Plug & Play Universal Systems Module, the 1U and 4U hardware can share optical and copper port connectivity in the same housing or be migrated to an all-optical solution in the future.

Utilisation of the Media Converter Modules allows you to reap all the benefits of installing a Plug & Play Universal Systems MTP Connector-based fibre cabling system, while at the same time leveraging existing copper port-based electronics.

Media Converter Module
MCM Hardware

Application

Data centre local area networks (LAN)

Campus backbone

Horizontal wiring

Description

The Media Converter Module is configured with 12 modular RJ45 ports on the front and two MTP® Connector ports on the back, which are compliant with EIA/TIA 604-5.
Each port on the Media Converter Module converts an IEEE 802.3 ab compliant Gigabit Ethernet 1000BASE-T over copper to 1000BASE-SX over fibre, providing the highest-density media conversion solution available.

Features

- High-density, lightweight optical cabling provides a sizeable improvement in cable tray utilisation, while providing greater data centre cooling efficiency
- Error-free, high-data-rate fibre optic transmission that is immune to EMI, RFI and cross talk
- Modular MTP® Connectivity-based Plug & Play™ Universal Trunking Systems increase network flexibility, manageability and scalability and provide an easy migration path to emerging high-speed network interfaces and protocols, e.g. 100 Gigabit Ethernet, Infiniband, QSFP and parallel optics
- Installation time is reduced using an optical fibre infrastructure compared to copper systems, which require multiple time-consuming tests
- 1000BASE-T (RJ45) 100 m/328 ft to 1000BASE-SX 850 nm multimode MTP Connector 50 µm fibre 500 m/1640 ft
- Media Converter Module and Plug & Play Universal Systems Module share the same footprint, providing a simple migration path to all-optical networking

Description	Units per Delivery	Order Number
Media Converter Module fits in the 1U and 4U Housings, 1000BASE-T (RJ45) 100 m/328 ft to 1000BASE-SX 850 nm multimode MTP Connector 50 µm fibre 500 m/1640 ft, 12 modular EIA/TIA 568 RJ45 ports on the front and 2 EIA/TIA 604-5 Type MPO ports on the back, status LEDs: PWR (power), LK (link), overtemp, fan fault		
black	1/1	CCH-MCM12-RJ-70S

Media Converter Module

MCM Hardware

Specifications

04U Housing Dimensions (H x W x D)	17.78 x 43.18 x 40 cm (7 x 17 x 15.75 in)
Power Consumption	17 watts, 1.41 A @ 12 VDC
Maximum Packet Size	10 KB
MTBF	36,063 hours (MIL-217F2); 324,255 hours (Bellcore 7)
Environment	Operation: 0° to +40°C
	Storage: 5-95% humidity non-condensing; 0-10000 ft altitude
Compliance Standards	EN55024; CISPR22/EN55022 Class A; FCC Class A; CE Mark
	IEEE Std 802.3™ - 2005
Fibre Optic Connector	Multimode / Min TX PWR: -7.5 / Max TX PWR: -2.0 dBm
	RX Sensitivity: -16.0 dBm / Max In PWR: -2.0 dBm
	Link Budget: 8.5 dB

Description

The 4U Housing Solution accommodates up to 8 Media Converter Modules (96 RJ45 ports). It use the same footprint as Plug & Play™ Universal Systems components for an easy migration path to an all-optical networking solution.

Description	Units per Delivery	Order Number
4U Housing Solution for up to 8 Media Converter Modules, includes		
Power Cage, 2 power supplies and 1 power harness	1/1	PCH-04U-00
Power Cage, 2 power supplies, 1 power harness and Power Monitoring Module	1/1	PCH-04U-MM

Description

The 1U Housing Solution accommodates up to 2 Media Converter Modules (24 RJ45 ports). It use the same footprint as Plug & Play Universal Systems components for an easy migration path to an all-optical networking solution.

Description	Units per Delivery	Order Number
1U Housing Solution for up to 2 Media Converter Modules, includes		
Power Cage, 2 power supplies and 1 power harness	1/1	PCH-01U-00
Power Cage, 2 power supplies, 1 power harness and Power Monitoring Module	1/1	PCH-01U-MM

MCM Hardware

Accessories

Description	Units per Delivery	Order Number
4U Power Supply with redundant instant fail-over power supply; status LEDs: PWR;	1/1	PCH-04U-PWRS
AC 100-240VAC, 47-63 Hz; status EDs: PWR (power)		
4U Power Supply Cage	1/1	PCH-04U-CAGE
4U Wiring Harness for up to 8 Media Converter Modules	1/1	PCH-04U-HRNS
4U Power Supply Management Module	1/1	PCH-04U-PWRS-MGMT
01U Power Supply with redundant instant fail-over power supply; status LEDs:	1/1	PCH-01U-PWRS
AC 100-240VAC, 47-63 Hz; status LEDs: PWR (power)		
01U Power Supply Cage	1/1	PCH-01U-CAGE
01U Wiring Harness	1/1	PCH-01U-HRNS
01U Power Supply Management Module	1/1	PCH-01U-PWRS-MGMT

AutoCross™ Functionality

AutoCross functionality detects any ports between the converter and the switch that are incorrectly linked as transmit-to-transmit or receive-to-receive and reconfigures the twisted pair port of the converter internally to correct the link.

Auto Negotiation

Auto Negotiation allows two media devices to perform automatic configuration to achieve the best possible mode of operation over a link. Devices with this feature will broadcast their speed (10 Mbps, 100 Mbps, etc.) and duplex (half/full) capabilities to other devices and negotiate the best mode of operation between the two devices, optimising transmission.

Link Pass Through

In the event of a loss of signal in a receiver port, the converter will automatically disable the transmit signal of the other media port, thus „passing through“ the link-loss. The end device is automatically notified of the link-loss. This prevents the loss of valuable data unknowingly transmitted over an invalid link.

Automatic Link Restoration

If a network link is lost, a media converter with Automatic Link Restoration will automatically re-establish the link in all network conditions with no need to reset devices.

PAUSE

PAUSE signaling is an IEEE feature that is used to temporarily suspend data transmission between two devices in the event that one of the devices becomes overwhelmed. In the event that a device needs some time to clear network congestion, it will send out a PAUSE signal to the other end device, which will then wait a pre-determined amount of time before re-transmitting the data. This feature helps to reduce network bottlenecks and protects valuable data.

12 Tools and Accessories

12.1. S1200 Tools 250

12.2. FutureCom Tools 251

S1200 Tools

S1200 Assembly Tool

- Integrated knife for the removal of the jacket
- Stripping option for PiMF foils with a defined length
- Management for arrangement or shaping of the individual pairs (PiMF)
- Defined section length of wires

Description	Units per Delivery	Order Number
S1200 assembly tool, for installation of S1200 modules and S1200/4 or S1200/2 connectors		
yellow	1/1	CAXFSN-00000-C001

Copper Conducting Tape 9 x 45 mm

Description	Units per Delivery	Order Number
Copper conducting tape 9 x 45 mm on roll, for FutureCom™ modules		
9 x 45 mm	1000/1	CAXCSN-00000-C011

Comfort Parallel Pliers

Description	Units per Delivery	Order Number
Comfort Parallel Pliers for termination of IDC contacts on FutureCom S1200 modules		
metal	1/1	CAXCSN-00000-C008

FutureCom Tools

Assembly Tool for Basic Modules

Description	Units per Delivery	Order Number
Assembly tool for connecting basic modules with wire management, suitable for FutureCom™ S10^{TEN}, S10^{TENfx}, S250, S250^{fx}, S100^{e}, and S100^{eL} modules		
composite	1/1	CAXCSN-00000-C007

Assembly Tool for Basic Modules

Description	Units per Delivery	Order Number
Assembly tool for connecting basic modules with wire management, suitable for FutureCom™ S10^{TEN}, S10^{TENfx}, S250, S250^{fx}, S100^{e}, and S100^{eL} modules, metal version		
metal	1/1	CAXCSN-00000-C003

Crimping Pliers for additional strain relief

Description	Units per Delivery	Order Number
Assembly tool for connecting basic modules with wire management, suitable for FutureCom™ S10^{TEN}, S10^{TENfx}, S250, S250^{fx}, S100^{e}, and S100^{eL} modules, metal version		
metal	1/1	CAXCSN-00000-C002

Assembly Tool for S10^{TEN}e Modules

Description	Units per Delivery	Order Number
Assembly tool for connecting FutureCom™ S10^{TEN}e basic module with wire management		
metal	1/1	CAXCSN-00000-C009

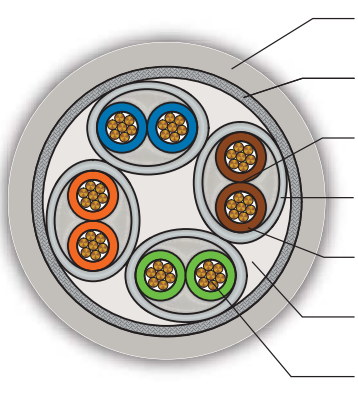
13 FutureCom™ Flex Wire Cables

13.1. S/FTP flex/26 254

13.2. SF/UTP flex/26 256

FutureCom™ Flex Wire Cables

S/FTP flex/26, Cat. 7 Cables



Application

The FutureCom™ S/FTP 600 flex/26 flex cable is specified up to 600 MHz and provides transmission performance meeting Category 7 cable specifications EN 50288-4-2 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Additional features are the slim design and low weight of the cable.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP flex/26 cable, specified up to 600 MHz
- Flexible
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Minimum surface transfer impedance (<10 mΩ/m at 10 MHz)
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Suitable for IDC contacting
- Unprinted

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥17 mm
Min. bending radius during installation	≥40 mm
Copper conductor	AWG 26

Electrical characteristics (at 20°C)

Largest resistance margin	2 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Mutual capacity	43 pF/m
Propagation velocity at >10 MHz (NVP*c)	0.78 * c
Propagation delay ≥10 MHz	4.3 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**20**	**31.25**	**62.5**	**100**	**300**	**600**
Attenuation according to standard [dB/100 m]*	2.9	8.5	12.1	15.2	21.7	27.8	50.0	73.3
Typical attenuation [dB/100 m]	**2.9**	**7.9**	**10.8**	**13.5**	**19.5**	**25.2**	**44.3**	**63.5**
NEXT according to standard [dB/100 m]*	80	80	80	80	75.1	72.4	65.3	60.8
Typical NEXT values [dB/100 m]	**96.0**	**96.0**	**96.0**	**96.0**	**95.0**	**94.0**	**86.0**	**80.0**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	72.5	69.4	62.3	57.8
Typical PSNEXT values [dB/100 m]	**93.0**	**93.0**	**93.0**	**93.0**	**92.0**	**91.0**	**83.0**	**77.0**
ELFEXT according to standard [dB/100 m]*	80	74	68	64.1	58.1	54	44.5	38.4
Typical ELFEXT values [dB/100 m]	**95.0**	**93**	**93**	**88.0**	**81.0**	**72.0**	**60.**	**51.0**
PSELFEXT according to standard [dB/100 m]*	77	71	65	61.1	55.1	51.0	41.5	35.4
Typical PSELFEXT values [dB/100 m]	**92.0**	**90**	**90**	**85.0**	**78.0**	**69.0**	**57.0**	**48.0**
ACR according to standard [dB/100 m]*	77.1	71.5	67.9	64.8	53.4	44.6	15.3	-
Typical ACR values [dB/100 m]	**93.1**	**88.1**	**85.2**	**82.5**	**75.5**	**68.8**	**47.7**	**16.5**

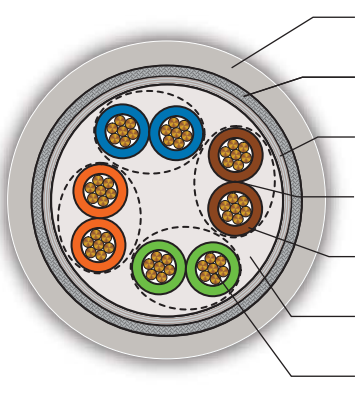
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-2)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP flex/26	7	4	0.43	Yes	gray	5.9	40	1000	**CCXFGB-G0047-0001-L7**
S/FTP flex/26	7	4	0.43	Yes	blue	5.9	40	1000	**CCXFGB-G0047-0002-L7**
S/FTP flex/26	7	4	0.43	Yes	yellow	5.9	40	1000	**CCXFGB-G0047-0003-L7**
S/FTP flex/26	7	4	0.43	Yes	green	5.9	40	1000	**CCXFGB-G0047-0004-L7**
S/FTP flex/26	7	4	0.43	Yes	red	5.9	40	1000	**CCXFGB-G0047-0005-L7**
S/FTP flex/26	7	4	0.43	Yes	black	5.9	40	1000	**CCXFGB-G0047-0006-L7**

FutureCom™ Flex Wire Cables

SF/UTP flex/26



Application

The FutureCom™ SF/UTP flex/26 patch cord cable is specified for applications up to 300 MHz and it´s outstanding transmission characteristics satisfy category 5 (2002) according to ISO/IEC 11801(2002) and EN 50173-1 (2003) and also category 5e according to TIA/EIA-568-A-5 specifications.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are sheathed with a foil shield (F/UTP) and additionally with a braid shield (SF/UTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- SF/UTP flex/26 cable, specified up to 300 MHz
- Flexible
- Outstanding electrical characteristics
- Full shielding with foil shield and additional braid shield
- Streamlined design
- Lightweight
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Suitable for IDC contacting
- Unprinted

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥15 mm
Min. bending radius during installation	≥35 mm
Copper conductor	AWG 26

Electrical characteristics (at 20°C)

Largest resistance margin	3 %
Insulation resistance	>150 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<100 mΩ/m at 10 MHz
Mutual capacity	48 pF/m
Propagation velocity at >10 MHz (NVP*c)	0.78 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**4**	**10**	**20**	**31.25**	**62.5**	**100**	**1**
Attenuation according to standard [dB/100 m]*	3.2	6.0	9.5	13.6	17.1	24.8	32.0	-
Typical attenuation [dB/100 m]	**3.0**	**5.8**	**9.0**	**12.2**	**14.7**	**22.5**	**27.3**	**3.0**
NEXT according to standard [dB/100 m]*	65.3	56.3	50.3	45.8	42.9	38.4	35.3	-
Typical NEXT values [dB/100 m]	**70.0**	**65.0**	**60.0**	**52.0**	**48.0**	**45.0**	**42.0**	**70.0**
PSNEXT according to standard [dB/100 m]*	62.3	53.3	47.3	42.8	39.9	35.4	32.3	-
Typical PSNEXT values [dB/100 m]	**68**	**68**	**58.0**	**50.0**	**46.0**	**43.0**	**40.0**	**68**
ELFEXT according to standard [dB/100 m]*	63.8	51.8	43.8	37.8	33.9	27.9	23.8	-
Typical ELFEXT values	-	-	-	-	-	-	-	-
PSELFEXT according to standard [dB/100 m]*	60.8	48.8	38.8	34.8	30.9	24.9	20.8	-
Typical PSELFEXT values	-	-	-	-	-	-	-	-
ACR according to standard [dB/100 m]*	62.1	50.3	40.8	32.2	25.8	13.6	3.3	-
Typical ACR values [dB/100 m]	**67.0**	**59.2**	**51.0**	**39.8**	**33.3**	**22.5**	**17.7**	**67.0**

* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-2)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Outer Ø [mm]	Weight [kg/km]	Length [m]	Order Number
SF/UTP flex/26	5_e	4	0.39	Yes	gray	5.1	31	1333	**CCXDGF-C0047-0001-H2**
SF/UTP flex/26	5_e	4	0.39	Yes	blue	5.1	31	1333	**CCXDGF-C0047-0002-H2**
SF/UTP flex/26	5_e	4	0.39	Yes	yellow	5.1	31	1333	**CCXDGF-C0047-0003-H2**
SF/UTP flex/26	5_e	4	0.39	Yes	green	5.1	31	1333	**CCXDGF-C0047-0004-H2**
SF/UTP flex/26	5_e	4	0.39	Yes	red	5.1	31	1333	**CCXDGF-C0047-0005-H2**
SF/UTP flex/26	5_e	4	0.39	Yes	black	5.1	31	1333	**CCXDGF-C0047-0006-H2**

14 FutureCom™ Special Cables

14.1. Outdoor Cables

14.1.1. S/FTP 800/23 with Diffusion Barrier 260

14.1.2. F/UTP 300/24 PE 262

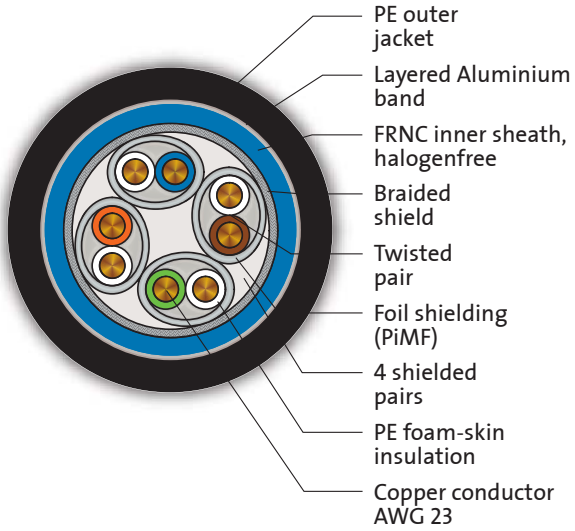
14.2. Hybrid Cables

14.2.1. Fibre Blow S/FTP 1000/23 264

14.2.2. Fibre Blow S/FTP 800/23 266

FutureCom™ Special Cables

S/FTP 800/23 with Diffusion Barrier, Cat. 7 Outdoor Cable



Application

The FutureCom™ S/FTP 800/23 outdoor cable with diffusion barrier is designed for applications up to 800 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- S/FTP 800/23 outdoor cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Includes a diffusion barrier (Aluminium band and PE sheath, UV resistant)
- Low skew between the pairs
- Halogen-free (LSZH)
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Can be directly buried

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	PE
Area/range of application	Outdoor installation
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-40 °C to 60 °C
Min. bending radius for one-time bending	≥35 mm (for 2 or 3x (4x2...) over flat side)
Min. bending radius during installation	≥60 mm (for 2 or 3x (4x2...) over flat side)
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Mutual capacity	43.0 pF/m
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

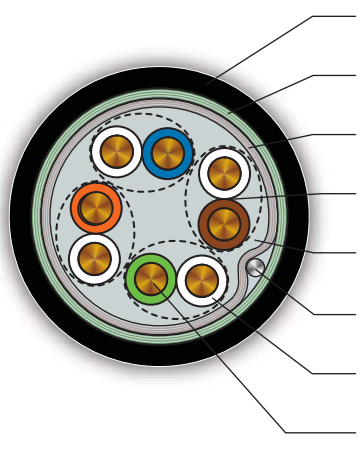
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
S/FTP 800/23 with Diffusion Barrier	7	4	2.98	Yes	black	367	11.7	126	1000	**CCXSDB-F0047-C001-L7**

FutureCom™ Special Cables

F/UTP 300/24 PE, Cat. 5e Outdoor Cable



Application

The FutureCom™ F/UTP 300/24 PE cable is designed for outdoor applications up to 300 MHz and its transmission characteristics exceed Category 5 (2002) and category 5e (TIA/EIA 568-A-5) specifications.

The improved operating temperature of up to -60 °C enables direct laying in the ground in the most adverse conditions.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet. The cable has a streamlined construction and low weight.

The four stranded pairs are foil shielded (F/UTP). The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Colour Coding

Pair 1	white with blue rings/blue
Pair 2	white with orange rings/orange
Pair 3	white with green rings/green
Pair 4	white with brown rings/brown

Features

- F/UTP 300/24 PE outdoor cable specified up to 300 MHz
- Outstanding electrical characteristics
- Stranded Pairs
- Double foil shielding and additional copper wire
- Streamlined design
- Lightweight
- Low skew between the pairs
- PE jacket, halogen-free

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	PE
Area/range of application	Outdoor installation
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-60 °C to 60 °C
Min. bending radius for one-time bending	≥19 mm (for 2x (4x2...) over flat side)
Min. bending radius during installation	≥50 mm (for 2x (4x2...) over flat side)
Copper conductor	AWG 24

Electrical characteristics (at 20°C)

Largest resistance margin	2 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	185 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.74 * c
Propagation delay ≥10 MHz	4.5 ns/m
Delay skew	7 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**250**	**300**
Attenuation according to standard [dB/100 m]*	2.1	-	8	9	11.4	16.5	21.3	-	-
Typical attenuation [dB/100 m]	**2**	**5.6**	**7.2**	**8**	**10.1**	**14.4**	**18.2**	**29.5**	**32.2**
NEXT according to standard [dB/100 m]*	65.3	-	47.2	45.8	42.9	38.4	35.3	-	-
Typical NEXT values [dB/100 m]	**77**	**62**	**59**	**57**	**54**	**50**	**46**	**38.5**	**35**
PSNEXT according to standard [dB/100 m]*	62.3	-	44.2	42.8	39.9	35.4	32.3	-	-
Typical PSNEXT values [dB/100 m]	**75**	**60**	**57**	**55**	**52**	**48**	**44**	**36.5**	**33**
ELFEXT according to standard [dB/100 m]*	63.8	-	39.7	37.8	33.9	27.9	23.8	-	-
Typical ELFEXT values [dB/100 m]	**72**	**60**	**54**	**52**	**48**	**40**	**34**	**22.1**	**17**
PSELFEXT according to standard [dB/100 m]*	60.8	-	36.7	34.8	30.9	24.9	20.8	-	-
Typical PSELFEXT values [dB/100 m]	**70**	**58**	**52**	**50**	**46**	**38**	**32**	**20.1**	**15**
ACR according to standard [dB/100 m]*	63.2	-	39.3	36.8	31.5	21.9	14	-	-
Typical ACR values [dB/100 m]	**75**	**56.4**	**51.8**	**49**	**43.9**	**35.6**	**27.8**	**9**	**2.8**

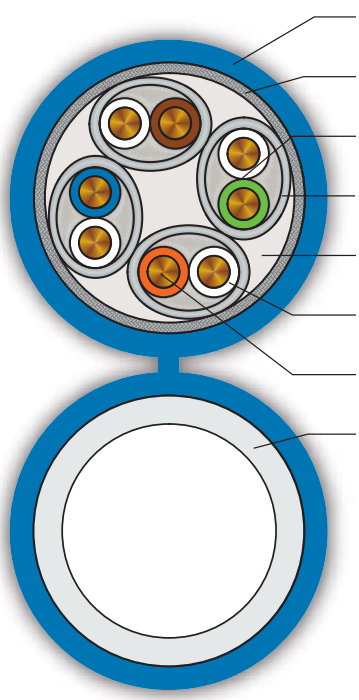
* Standard: Requirements on 100 m of installed Category 5 cable for Class D cabling sections (conforms with EN 50288-2-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
F/UTP 300/24 PE	5_e	4	0.72	Yes	black	93	6.2	36	1000	**CCXDAE-C0047-C001-L7**

FutureCom™ Special Cables

Fibre Blow S/FTP 1000/23, Hybrid Cable



Application

The FutureCom™ Fibre Blow S/FTP 1000/23 cable is designed for applications up to 1000 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5. It is prepaired for subsequent blowing in of up to 12 fibres (single or multimode fibres with 250 µm diameter). Future-proof cabling, for example fibre-to-the-desk (FttD), can be easily realised.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- Fibre Blow S/FTP 1000/23 cable specified up to 1000 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Prepared for subsequently blowing in up to 12 fibres

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥100 mm over flat side
Min. bending radius during installation	≥100 mm over flat side
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m
Delay skew	4 ns/100 m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**900**	**1000**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-	-
Typical attenuation [dB/100 m]	**1.7**	**5.0**	**6.5**	**7.3**	**9.2**	**13.2**	**16.8**	**30**	**42.5**	**55**	**59**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**100**	**96**	**92**	**86**	**83**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**94**	**90**	**84**	**81**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**83.2**	**66.0**	**49.5**	**31**	**24**

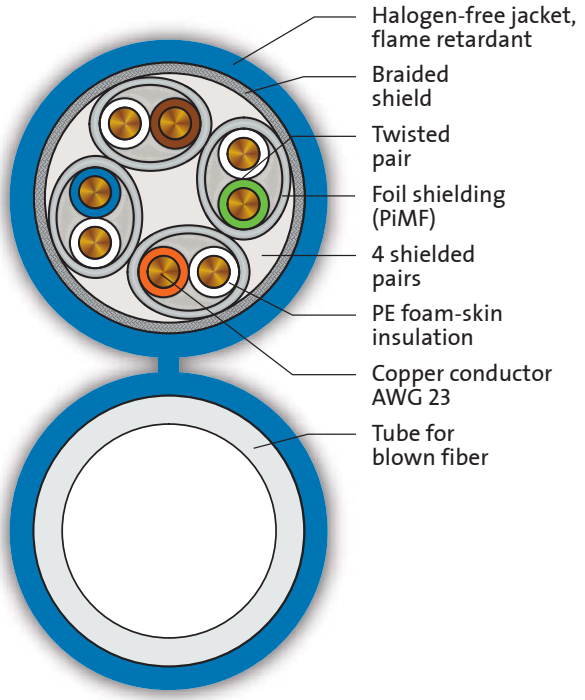
* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
Fibre Blow S/FTP 1000/23	7	4	1.81	Yes	blue	163	7.5 x 16.0	100	500	**WCXWDW-I0047-C001-L6**

FutureCom™ Special Cables

Fibre Blow S/FTP 800/23, Hybrid Cable



Application

The FutureCom™ Fibre Blow S/FTP 800/23 cable is designed for applications up to 800 MHz and its transmission characteristics exceed Category 7 specifications according to EN 50288-4-1 and IEC 61156-5. It is prepaired for subsequent blowing in of up to 12 fibres (single or multimode fibres with 250 µm diameter). Future-proof cabling, for example fibre-to-the-desk (FttD), can be easily realised.

High system margins for the complete link according to ISO/IEC 11801 (2002) and EN 50173-1 (2003) will be achieved by using corresponding hardware together with this high-end copper cable.

Due to the very low delay skew between the pairs these FutureCom cables are especially suitable for Gigabit Ethernet and also for transmission of digital data for future applications up to 10 Gigabit Ethernet according to IEEE 802.3an.

Each pair is individually foil shielded. The stranded pairs (PiMF) are also sheathed with a braid shield (S/FTP), which guarantees outstanding shielding characteristics. The cable satisfies Class B interference radiation standards according to EN 55022, as well as immunity according to EN 55024, which enables the realisation of CE-compatible networks.

Features

- Fibre Blow S/FTP 800/23 cable specified up to 800 MHz
- Outstanding electrical characteristics
- Each twisted pair is shielded with metal foil (PIMF)
- Full copper braid shield
- Low skew between the pairs
- Halogen-free (LSZH)
- Flame retardant according to IEC 60332-1 and EN 50266-2-1
- Non-corrosive according to IEC 60754-2 (FRNC) and EN 50267
- Low smoke according to IEC 61034 and EN 50268
- Prepared for subsequently blowing in up to 12 fibres

Mechanical characteristics

Conductor insulation	Halogen-free foam-skin material
Outer jacket	Halogen-free, flame retardant
Area/range of application	Dry and dump rooms
Temperature range (installation)	0 °C to 50 °C
Operating temperature	-20 °C to 60 °C
Min. bending radius for one-time bending	≥100 mm over flat side
Min. bending radius during installation	≥100 mm over flat side
Copper conductor	AWG 23

Electrical characteristics (at 20°C)

Largest resistance margin	1 %
Insulation resistance	>5000 MΩ x km
Impedance Z_o at 0.064 MHz	125 Ω +/- 20%
Impedance Z_o at 1-100 MHz	100 Ω +/- 15%
Surface transfer impedance	<10 mΩ/m at 10 MHz
Unbalance to ground dB/ref. length = 1000 m	>46 dB at 64 kHz
Unbalance to ground dB/ref. length = 100 m	>40 dB at 1 MHz
Mutual capacity	43.0 pF/m
Propagation velocity at >10 MHz (NVP*c)	0.79 * c
Propagation delay ≥10 MHz	4.2 ns/m

Electrical characteristics (at 20°C)

Frequency [MHz]	**1**	**10**	**16**	**20**	**31.25**	**62.5**	**100**	**300**	**600**	**800**
Attenuation according to standard [dB/100 m]*	2	5.7	7.2	8.1	10.1	14.5	18.5	33.3	48.9	-
Typical attenuation [dB/100 m]	**1.7**	**5**	**6.5**	**7.3**	**9.2**	**13.2**	**16.9**	**30.7**	**44**	**53**
NEXT according to standard [dB/100 m]*	80	80	80	80	80	75.1	72.4	65.3	60.8	-
Typical NEXT values [dB/100 m]	**>100**	**>100**	**>100**	**>100**	**>100**	**>100**	**99**	**95**	**91**	**87**
PSNEXT according to standard [dB/100 m]*	77	77	77	77	77	72.5	69.4	62.3	57.8	-
Typical PSNEXT values [dB/100 m]	**98**	**98**	**98**	**98**	**98**	**98**	**97**	**93**	**89**	**85**
ELFEXT according to standard [dB/100 m]*	80	74	69.9	68	64.1	58.1	54.0	44.5	38.4	-
Typical ELFEXT values [dB/100 m]	**93**	**93**	**93**	**93**	**90**	**86**	**83**	**68**	**51**	**-**
PSELFEXT according to standard [dB/100 m]*	77	71	66.9	65	61.1	55.1	51	41.5	35.4	-
Typical PSELFEXT values [dB/100 m]	**91**	**91**	**91**	**91**	**88**	**84**	**81**	**66**	**49**	**-**
ACR according to standard [dB/100 m]*	78	74.3	72.8	71.9	69.5	60.6	53.9	32	11.9	-
Typical ACR values [dB/100 m]	**98.3**	**95**	**93.5**	**92.7**	**90.8**	**86.8**	**82.1**	**64.3**	**47**	**34**

* Standard: Requirements on 100 m of installed Category 7 cable for Class E_A/F cabling sections (conforms with EN 50288-4-1)

Ordering Information

Type designation	Cat.	No. of Pairs	Fire Load [MJ/m]	Halogen-free	Colour	Tensile Strength [N]	Outer Ø [mm]	Weight [kg/km]	Length [m]	**Order Number**
Fibre Blow S/FTP 800/23	7	4	1.81	Yes	blue	163	7.5 x 16.0	100	500	**WCXWDW-F0047-C001-L6**

15 Further Information

15.1. LANscape® Training 270

15.2. EWP: Extended Warranty℠ Program 271

15.3. Glossary 273

15.4. Type Codes for Copper Cables 276

15.5. Product Index 277

LANscape® Training

Training: Expertise for Your Employees

Total communication solutions are becoming increasingly important for communication networks, in particular local area networks (LANs), because the future lies in the convergence of voice, video and data. Around the globe, as information infrastructures evolve, so the demands on the quality of networked communication solutions continue to grow. Meeting these demands calls for knowledge - knowledge that we can pass on to you.

Techniques and products are subject to constant change. This makes it essential to have highly trained employees who know how to exploit technical progress to your advantage.

This can only be achieved with continuous training.
As a leading provider of communication cables, hardware and services, we are working with our customers to build communication highways for the future. We realize that the planning, installation and maintenance of cable systems calls for comprehensive technical knowledge - something we want to share with you in the spirit of genuine partnership.

For more information about EWP:

On the Internet:
http://www.corningcablesystems.com/web/emea/emea.nsf/eu/ewp

Or via e-mail:
emea.cs@corning.com

Or by phone on:
Freephone: 00800 2676 4641

Detailed training information is available on request.

We Train – You Benefit

Our worldwide knowledge in cable and network technology is channeled into our Training Centre. It is from this knowledge base that we develop a wide range of seminars for your employees.
Our training is aimed at all organizations involved in constructing or operating cable systems in the private networks or carrier area. By undertaking training before starting on a project, you can avoid costly installation errors, and take a decisive step towards ensuring a successful outcome to your project.

Practical Orientation – Not Just Theory

The balance between the two is critical: theory is necessary, but practice dictates what is done. From many years of practical experience, our trainers know which knowledge and skills are required for each task, and they are in constant contact with development, sales and project engineering teams at Corning Cable Systems.

Our Training Centre is located in Berlin, Germany. Standard and customised courses to meet individual requirements are held locally throughout the world, where technical facilities permit.

Course Portfolio Private Networks:

LANscape® Certified Approved Installer Courses for Structured Premises Cabling

LANscape® Installation Course (2 days)
LANscape® Refresher Course (1 day/every 2 years)

EWP: Extended Warranty℠ Program

Extra Value through Extended Warranty℠ Program (EWP)

Under the Corning Cable Systems' LANscape® Extended Warranty Program (EWP Program) your LANscape Fibre Optic and/or High-end Copper Solution is protected for a full 25 years*. The warranty covers each product component of the Corning Cable Systems' solution.

Corning Cable Systems warrants to repair or provide a replacement product for defective products for 25 years upon installation by an Extended Warranty Program Partner (EWPPartner). The LANscape EWP 25-year Extended Warranty is offered when all products in the cabling solution (cables, connectivity and interconnecting hardware) are Corning Cable Systems products installed according to Corning Cable Systems' recommended installation procedures by an EWP Partner.

LANscape® Solutions Total Package

The LANscape® end to end product offering is designed to deliver the most technologically advanced communications systems to the customer.
Corning Cable Systems LANscape® products withstand rigorous field and laboratory testing with continual design enhancements in response to rapidly evolving customer environments.

CORNING

EWP Extended Warranty℠ Program

Ready for Your Growing Network

Corning Cable Systems understands the critical need for flexible solutions with the rapid growth of your data communications requirements. With Corning Cable Systems' LANscape® Solutions, changes and expansions are cost effective and simple.

Meeting and Exceeding Global Standards

Corning Cable Systems warrants that each customised Corning Cable Systems LANscape® Cabling Solution meets or exceeds the global data communication and performance standards. Your Corning Cable Systems Solution measures up to the international cabling requirements, ISO/IEC 11801 and EN 50173 (Europe).

Installation Expertise and Reliability

Corning Cable Systems' network of LANscape® EWP Program installers are carefully selected and trained.

Each partner-company meets our stringent requirements for technical experience and proven dedication to quality. EWP partners must demonstrate ongoing commitment to extensive training and are required to update training at least once every two years.

EWP: Extended Warranty^{SM} Program

Expert Service and Support

If required Corning Cable Systems' experts provide support to EWP Partner for the planning and installing of fibre optic and high-end copper cabling systems.

With world-wide distribution channels and a high class Customer Service Centre, Corning Cable Systems makes it easy for EWP Partners to quickly get products to your site for installation. A highly trained sales force located in your area is available for on-site evaluations and cabling recommendations.

For more information about EWP:

On the Internet:
http://www.corningcablesystems.com/web/emea/emea.nsf/eu/ewp

Or via e-mail:
emea.cs@corning.com

Or by phone on:
Freephone: 00800 2676 4641

CORNING | EWP Extended Warranty^{SM} Program

Total Corporate Assurance

Corning Cable Systems' primary focus is on fibre and high-end copper solutions. Our mission is to remain an industry leader in the development and manufacturing of fibre optic and high-end copper products for voice, data and multimedia applications.

Corning Cable Systems' research and product development resources, financial strength and mature business focus are clearly unmatched in the communications industry.

Corning Inc. is the inventor of the first commercial optical fibres and has been a world leader in optical fibre manufacturing for over 25 years. Our unique heritage makes Corning Cable Systems one of a small number of companies that can offer a solid corporate foundation, a tradition of quality and a name you can trust.

How You Benefit

- LANscape® 25 years Extended Warranty
- Installation by Corning Cable Systems approved EWP Partners
- Partners trained on the latest technology
- Corning Cable Systems total quality

*The Extended Warranty of Corning Cable Systems GmbH & Co. KG is subject to the terms and conditions set forth in (i) the EWP Contract signed by Corning Cable Systems and the EWP Partner and (ii) the Warranty Statement issued by Corning Cable Systems to the end customer of an installation. A copy of the terms can be provided on demand.

Glossary

ACR	Attenuation-to-crosstalk ratio
ANEXT	Crosstalk noise from other cables in a bundle of cables or from a second cable unit in a duplex cable
ATM	Asynchronous Transfer Mode is a network technology based on transferring data in cells or packets of fixed size. ATM supports data transfer rates of from 25 to 622 Mbps (megabits per second).
AWG	American designation for conductor diameter (American Wire Gauge).
Attenuation	Reduction in electrical signal power between two defined points on a transmission path. It is frequency dependent and caused mainly by resistance and the skin effect (unit: dB).
Attenuation constant	Known also as attenuation coefficient, it is the length related attenuation introduced by the cable in the stationary condition (unit: dB/km or dB/100m).
Cable Core	The totality of cabling elements in the cable and the wrapping covering all these elements.
Cable sheath	Covering, generally of polyethylene (PE), polyvinylchloride (PVC) or zero-halogen material (H), to protect the cable core against environmental influences.
Capacitance unbalance	The difference between the ground capacitances of the two conductors.
Chracteristic impedance	Complex quantity defining the ratio of voltages to currents in a propagating wave at every point along the line.
Conductor	The conductor is used for transporting the electrical charge carriers and is therefore made of electrically conducting material (metal). The conductor is usually round.
Conductor resistance	Conductor resistance is determined by the quality of the copper used and the cross-section of the conductor. It increases linearly with cable length and has a determining influence on the attenuation.
Corrosive	Release of corrosive gases and acids by the combustion of cables and lines. For indoor installations, non-corrosive cables should be used. Halogen-free cables are generally non corrosive.
Dielectric	Insulating material, also termed dielectric medium, i.e. an electrically non-conducting material.
FEXT	Far-end crosstalk loss is the attenuation between the transmission circuits of a cable at the different ends of the cable.
FRNC	Flame retardant (FR) and non corrosive (NC)
Fire Load	Sum of the combustion heat of all the combustible materials located in a room (unit for cables: MJ/m)
Flame retardant	Description of the behaviour of products with respect to fire propagation. Enhanced flame retardancy is generally required only for indoor cables.
Frequency	Number of complete cycles per second (in Hz)

Glossary

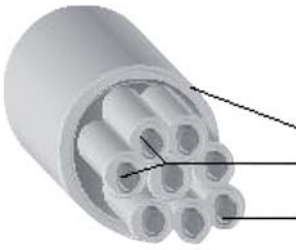
Impedance	Impedance of an electrical four-terminal network. It comprises the DC resistance and the reactance, the latter being the frequency-dependent opposition to current flow offered by inductances and capacitances. Impedance is physically determined by the dimensions of inner conductor, dielectric and shield.
Insulation resistance	This is determined by the insulating material and more particularly by the nature of the insulant than by its thickness. The insulation resistance is length dependent.
LAN: Local Area Network	Local network for bit-serial transmission between interconnected, independent terminal equipments. The term LAN was introduced in order to distinguish this network from processor links (central processor unit with peripherals) operating at very high bit rates over short distances on the one hand and from publicly accessible networks operating over long distances on the other.
LS0H/LSZH	Low smoke (LS) and zero halogen (0H)
Length of lay	The distance along the centre axis of a cable that a cabling element advances in order to complete one full turn (360°) about this axis.
Mutual capacitance	Effective capacitance of the line
NEXT	Near-end crosstalk loss is the attenuation between the transmission circuits of a cable at the same end of the cable.
PS-ACR	The difference between attenuation and PSNEXT. The result is referred to as “head room”. The more head room a cable or system has the more forgiving it will be with the installation errors (apart from mis-wiring).
PSANEXT	Sum of the unwanted signal coupling of crosstalk noise at the near end from external cabling pairs into an affected pair of cable.
PSELFEXT	A computed sum value of the individual ELFEXT effects on each pair by the other 3 pairs. ELFEXT removes the impact of insertion loss on Far End Crosstalk.
PSNEXT	The sum of all pair combinations for crosstalk as it occurs when a signal is introduced into a communications cable, and measured at the near end to the transmitter.
Propagation delay	The time required for a signal to pass along a transmission line.
Propagation velocity	The velocity of wave propagation along a transmission line.
Quad	A series of four separately insulated conductors, generally twisted together.
Return Loss	The difference between the power incident upon a discontinuity in a transmission system and the power reflected from the discontinuity.
Shield	Structural cable element for shielding. The design of the shield depends on whether one is seeking protection against electric fields (capacitive coupling) or magnetic fields (inductive coupling) or against both. Shielding materials against magnetic fields should always have a high electrical conductivity and small inductance, which is why, in the case of conductors, copper is mostly used.

Glossary

Shielding	Protects against electric and magnetic influence caused by emission (emitted interference) and emission (received interference).
Skin effect	Tendency for higher frequency currents to travel near the outside surface of a conductor.
Smoke density	Measure of the smoke generated by a burning cable. For indoor installation, cables should be selected with a low smoke density (typical value: 50%).
Wire	The wire is a conductor with a surrounding insulant. The insulant can be air or other electrically non-conducting material (usually plastic).

Type Codes for Copper Cables

Acronyms for cable types according to ISO/IEC 11801 (2002) Annex E (informativ):

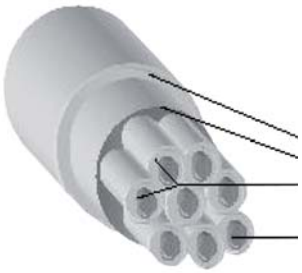


U/UTP (UTP*):

Cable sheath
Pair
Conductor

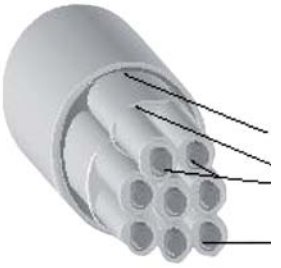
U/UTP (UTQ*):

Cable sheath
Quad
Pair / side circuit
Conductor



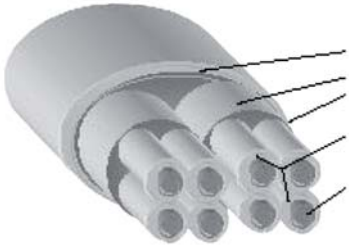
F/UTP (FTP*):

Cable sheath
Foil screen
Pair
Conductor



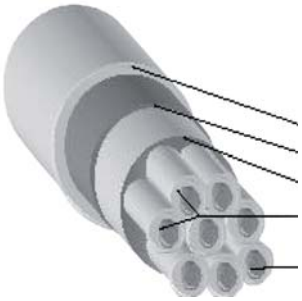
U/FTP (STP*):

Cable sheath
Foil pair screen (PiMF)
Pair
Conductor



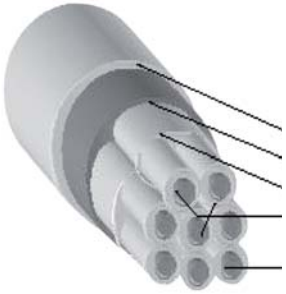
U/FTP (STQ*):

Cable sheath
Foil quad screen (ViMF)
Pair / side circuit
Conductor



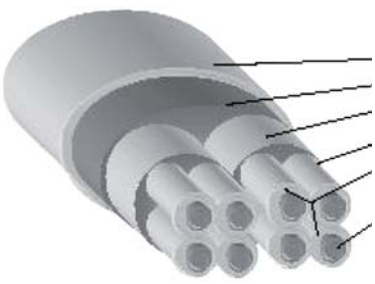
SF/UTP (S-FTP*):

Cable sheath
Braid screen
Foil screen
Pair
Conductor



S/FTP (S-STP*):

Cable sheath
Braid screen
Foil pair screen (PiMF)
Pair
Conductor



S/FTP (S-STQ*):

Cable sheath
Braid screen
Foil quad screen (ViMF)
Quad
Pair / side circuit
Conductor

*previously used notation

Product Index

Order Number	page
CAXASN-00000-C002	68
CAXASN-00000-C003	68
CAXCSE-G0201-C002	196
CAXCSE-G0201-C011	195
CAXCSE-G0201-C012	195
CAXCSE-S0101-C001	194
CAXCSE-S0101-C002	194
CAXCSE-U0200-C001	196
CAXCSE-U0201-C001	189
CAXCSE-V0201-C001	193, 204
CAXCSN-00000-C001	91, 125
CAXCSN-00000-C002	251
CAXCSN-00000-C003	251
CAXCSN-00000-C007	251
CAXCSN-00000-C008	30, 250
CAXCSN-00000-C009	68, 251
CAXCSN-00000-C011	30, 68, 250
CAXCSV-02500-C001	215
CAXCSV-02500-C002	216
CAXCSV-02503-C001	215
CAXCSV-02503-C002	216
CAXCSV-05000-C001	214
CAXCSV-05003-C001	214
CAXDSD-S0200-C001	155
CAXDSD-S0201-C001	154
CAXDSD-S0202-C001	154
CAXDSM-00100-C001	153, 188
CAXDSM-00200-C001	153
CAXDSV-02400-C001	154
CAXESD-S0200-C001	127
CAXESD-S0201-C001	126
CAXESD-S0202-C001	126
CAXESM-00100-C001	124, 184, 188, 191, 196
CAXESM-00200-C001	124
CAXESV-02400-C001	128
CAXFSD-V0208-C002	239
CAXFSD-V0408-C002	240
CAXFSE-S0201-C001	31
CAXFSM-00100-C001	27, 33, 35, 202
CAXFSN-00000-C001	30, 250
CAXFSN-00101-C001	27, 35
CAXFSN-00108-C001	27, 35
CAXFSN-00110-C001	27, 33, 202
CAXFSS-00100-C001	28
CAXFSS-00100-C002	29
CAXFSS-00100-C003	29
CAXFSS-00100-C004	28
CAXFSU-00600-C013	34
CAXFSU-00900-C012	35
CAXFSU-00900-C013	34

Order Number	page
CAXFSU-00900-C015	35
CAXFSV-01200-C001	37
CAXFSV-02400-C001	36
CAXFSV-02400-C002	36, 164
CAXGSD-S0201-C001	156
CAXGSD-S0202-C001	156
CAXGSM-00100-C001	153, 204
CAXGSV-02400-C001	156
CAXISD-V0103-C001	241
CAXTSD-S0201-C001	93
CAXTSD-S0201-C002	69
CAXTSD-S0202-C001	93
CAXTSD-S0202-C002	69
CAXTSM-00112-C001	91, 196
CAXTSM-00112-C002	67
CAXTSM-00112-C003	67
CAXTSV-02400-C001	94
CAXTSV-02400-C002	70
CAXTSV-02408-C002	70
CCACOC-A6002-A###-C0	217
CCADEE-B2044-A###-C0	159
CCADGF-D5102-A###-C0	158
CCADGF-D#002-A###-C0	157
CCAEDB-D2050-A###-C0	130, 174
CCAEDB-D2650-A###-C0	131, 175
CCAEDB-D2650-A###-EN	132, 176
CCAEGB-D1052-A###-C0	133, 177
CCAEGB-D10M0-A030-C0	134
CCAEGB-G#002-A###-C0	129
CCAFCB-M2042-A###-C0	51, 163
CCAFCB-M2058-A###-C0	52, 162
CCAFFE-A6027-A###-C0	47
CCAFFE-A6028-A###-C0	48
CCAFFE-A6034-A-C0	49
CCAFGB-G#021-A###-C0	41
CCAFGB-G1022-A###-C0	40
CCAFGB-G1026-A###-C1	39
CCAFGB-I4054-A030-C0	50
CCAFGB-I4055-A030-C0	50
CCAFGD-D1024-A###-C1	43
CCAFGD-D1124-A###-C1	44
CCAFGD-D1324-A###-C1	43
CCAFGF-D#021-A###-C0	42
CCAFOC-A6124-A###-C0	45
CCAFOC-A6125-A###-C0	46
CCAIHB-G70H2-A###-C0	230
CCAIHB-G70H1-A###-C0	231
CCATDB-F2063-A###-C0	97, 169
CCATDB-F2067-A###-C0	72, 165
CCATDB-F2663-A###-C0	98, 170

Product Index

Order Number	page
CCATDB-F2663-A###-EN	99, 171
CCATDB-F2667-A###-C0	73, 166
CCATDB-F2667-A###-EN	74, 167
CCATGB-F1062-A###-C0	100, 172
CCATGB-F1066-A###-C0	75, 168
CCATGB-F10M0-A030-C0	76, 101
CCATGB-G#002-A###-C0	71, 96
CCH-MCM12-RJ-70S	245
CCXCDE-B0047-C001-L7	121
CCXDAE-C0047-C001-L7	263
CCXDDA-D0047-C001-L7	119
CCXDDA-D0047-C001-X2	119
CCXDDA-D0087-C001-L6	119
CCXDEE-C0047-C001-L7	149
CCXDEE-C0047-C001-X1	149
CCXDEE-C0087-C001-L7	149
CCXDEF-C0047-C001-L7	141
CCXDEF-C0047-C001-X1	141
CCXDEF-C0087-C001-L7	141
CCXDEF-C0167-C001-L7	143
CCXDES-C0047-C001-L7	147
CCXDES-C0087-C001-L7	147
CCXDGF-C0047-0001-H2	257
CCXDGF-C0047-0002-H2	257
CCXDGF-C0047-0003-H2	257
CCXDGF-C0047-0004-H2	257
CCXDGF-C0047-0005-H2	257
CCXDGF-C0047-0006-H2	257
CCXDLE-C0047-C001-L7	151
CCXDLE-C0047-C001-X1	151
CCXDLE-C0087-C001-L7	151
CCXDLF-C0047-C001-L7	145
CCXDLF-C0047-C001-X1	145
CCXDLF-C0087-C001-L7	145
CCXEDB-D0047-C001-L7	65, 89, 115
CCXEDB-D0047-C001-X2	65, 89, 115
CCXEDB-D0087-C001-L6	65, 89, 115
CCXEDB-F0047-C001-L7	63, 87, 111
CCXEDB-F0047-C001-X2*	63, 87, 111
CCXEDB-F0087-C001-L6	63, 87, 111
CCXEDB-F0127-C001-L6	63, 87, 111
CCXEDB-I0047-C001-L7	61, 85, 109
CCXEDB-I0047-C001-X2*	61, 85, 109
CCXEDB-I0087-C001-L6	61, 85, 109
CCXEDB-I0127-C001-L6	61, 85, 109
CCXEDR-D0047-C001-L7	113
CCXEDR-D0047-C002-L7	117
CCXEDR-D0087-C001-L6	113
CCXEDR-D0087-C002-L6	117
CCXFCB-I0047-C001-L7	23, 59, 83
CCXFCB-I0087-C001-L6	23, 59, 83
CCXFCB-L0047-C001-L7	21
CCXFCB-L0087-C001-L6	21
CCXFCB-M0047-C001-L7	19
CCXFCB-M0087-C001-L6	19
CCXFCR-I0047-C001-L7	25
CCXFCR-I0087-C001-L6	25
CCXFGB-G0047-0001-L7	255
CCXFGB-G0047-0002-L7	255
CCXFGB-G0047-0003-L7	255
CCXFGB-G0047-0004-L7	255
CCXFGB-G0047-0005-L7	255
CCXFGB-G0047-0006-L7	255
CCXIHB-G0047-0007-H2	227
CCXIPB-F0047-C001-L7	225
CCXSDB-F0047-C001-L7	261
LAXLSM-00101-C004	188
LAXLSM-00101-C007	188
PCH-01U-00	246
PCH-01U-CAGE	247
PCH-01U-HRNS	247
PCH-01U-MM	246
PCH-01U-PWRS	247
PCH-01U-PWRS-MGMT	247
PCH-04U-00	246
PCH-04U-CAGE	247
PCH-04U-HRNS	247
PCH-04U-MM	246
PCH-04U-PWRS	247
PCH-04U-PWRS-MGMT	247
TKE:1304010	209
WAXISE-V0103-C001	241
WAXLSD-V0408-C001	234
WAXLSU-00000-C005	201
WAXLSU-00000-C006	201
WAXTSV-02400-C001	95, 173
WAXTSV-02408-C001	95, 173
WAXWSD-00000-C001	234
WAXWSD-U0401-C001	236
WAXWSD-U0401-C002	238
WAXWSD-U0407-C001	236
WAXWSD-U0407-C002	237
WAXWSD-U0408-C001	236
WAXWSD-V0208-C001	232
WAXWSD-V0208-C002	239
WAXWSD-V0408-C001	233
WAXWSD-V0408-C002	240
WAXWSE-00000-C001	238
WAXWSE-00001-C001	186, 188
WAXWSE-00001-C002	186

Product Index

Order Number	page
WAXWSE-00001-C003	186
WAXWSE-00001-C004	192
WAXWSE-00001-C005	32, 192
WAXWSE-00001-C006	192
WAXWSE-00001-C007	32, 192
WAXWSE-00001-C008	189
WAXWSE-00001-C009	185
WAXWSE-00001-C010	190
WAXWSE-00001-C011	187
WAXWSE-00001-C012	187
WAXWSE-00001-C013	187
WAXWSE-00002-C001	186
WAXWSE-00002-C002	186
WAXWSE-00002-C003	186
WAXWSE-00002-C011	187
WAXWSE-00002-C012	187
WAXWSE-00003-C001	185
WAXWSE-00004-C001	184, 185
WAXWSE-00005-C001	185
WAXWSE-00006-C001	185
WAXWSE-00007-C001	185
WAXWSE-00008-C001	184, 185
WAXWSE-00008-C002	190
WAXWSE-G0201-C001	182
WAXWSE-G0202-C001	182
WAXWSE-S0200-TE01	191
WAXWSE-S0201-C001	183
WAXWSE-S0202-C001	183
WAXWSE-S0203-C001	183
WAXWSE-S0208-C001	183
WAXWSE-S0301-C001	188
WAXWSE-S0301-C002	188
WAXWSE-S0302-C001	188
WAXWSE-S0302-C002	188
WAXWSE-V0201-C001	31
WAXWSE-V0201-C001	182
WAXWSE-V0201-C002	32
WAXWSE-V0201-C002	193
WAXWSE-V0201-C004	189
WAXWSE-V0202-C001	31
WAXWSE-V0202-C001	182
WAXWSE-V0301-C001	33
WAXWSE-V0301-C001	184
WAXWSE-V0302-C001	33
WAXWSE-V0302-C001	184
WAXWSE-V0601-C001	33
WAXWSE-V0601-C001	33, 184
WAXWSE-V0602-C001	33
WAXWSE-V0602-C001	184
WAXWSM-00101-C001	182

Order Number	page
WAXWSM-00108-C001	182
WAXWSU-00000-C001	204
WAXWSU-00000-C013	200
WAXWSU-00000-C014	200
WAXWSU-00100-C001	202
WAXWSU-00400-C001	203
WAXWSU-00600-C001	203
WAXWSU-00600-C002	204
WAXWSU-00600-C004	202
WAXWSU-00600-C013	197
WAXWSU-00900-C001	203
WAXWSU-00900-C012	199
WAXWSU-00900-C013	198
WAXWSU-00900-C014	198
WAXWSU-00900-C015	198
WAXWSU-00900-C016	199
WAXWSU-00900-C017	199
WAXWSV-01200-C001	205
WAXWSV-02400-C001	178, 205
WAXWSV-02400-C002	205
WAXWSV-02408-C001	178, 207
WAXWSV-02408-C002	207
WAXWSV-04800-C001	206
WAXWSW-00000-C002	209
WAXWSW-00000-C003	209
WAXWSW-00000-C004	206
WAXWSW-00000-C005	206
WAXWSW-00000-C007	206
WAXWSW-00000-C008	207
WAXWSW-00008-C004	208
WAXWSW-00008-C005	208
WAXWSW-00008-C007	208
WAXWSW-00008-C008	208
WAXWSW-00008-C013	211
WAXWSW-00008-C014	38
WAXWSW-00008-C015	210
WCXWDW-F0047-C001-L6	267
WCXWDW-I0047-C001-L6	265

Corning Cable Systems Catalogues

You can order the following catalogues by sending an email to emea.cs@corning.com, or a fax to +49 30 5303 2912.

LANscape® Fibre Optic Cabling Systems
English EUR-220-EN
German EUR-220-DE

FutureCom™ Copper Cabling Systems
English EUR-221-EN
German EUR-221-DE

Corning Customer Service Contacts:

CCS Customer Service Centre
Leipziger Strasse 121
10117 Berlin
Germany

Freephone Number:
00 800 CORNING 1
00 800 2676 4641

Fax: +49 30 5303-2335
Email: emea.cs@corning.com,
Web: www.corning.com/cablesystems

CORNING

Corning Cable Systems
GmbH & Co. KG
Leipziger Strasse 121
10117 Berlin, Germany
+49 30 5303 0

E-mail: emea.cs@corning.com
Web: www.corning.com/cablesystems