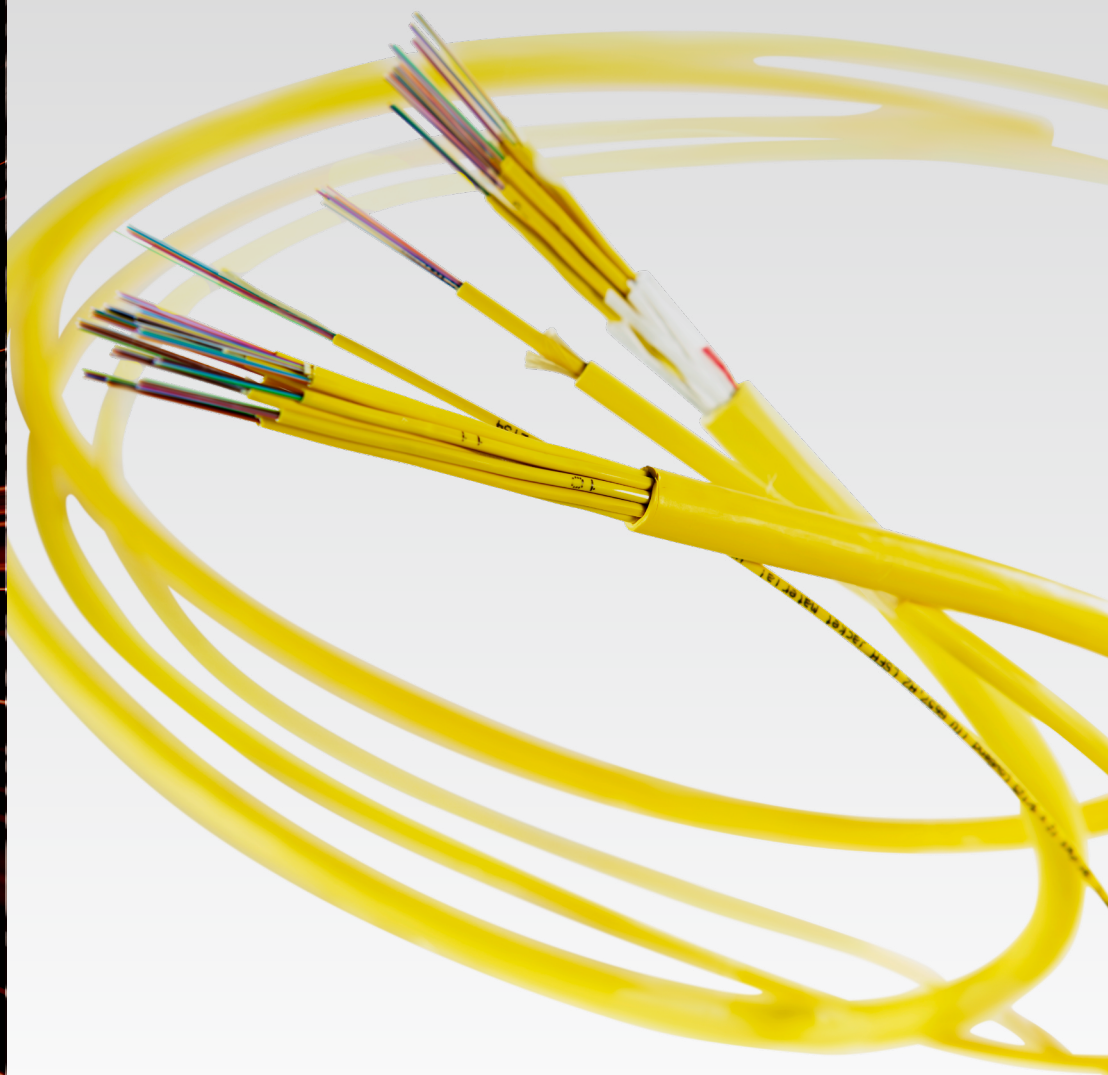


Fiber optic cables

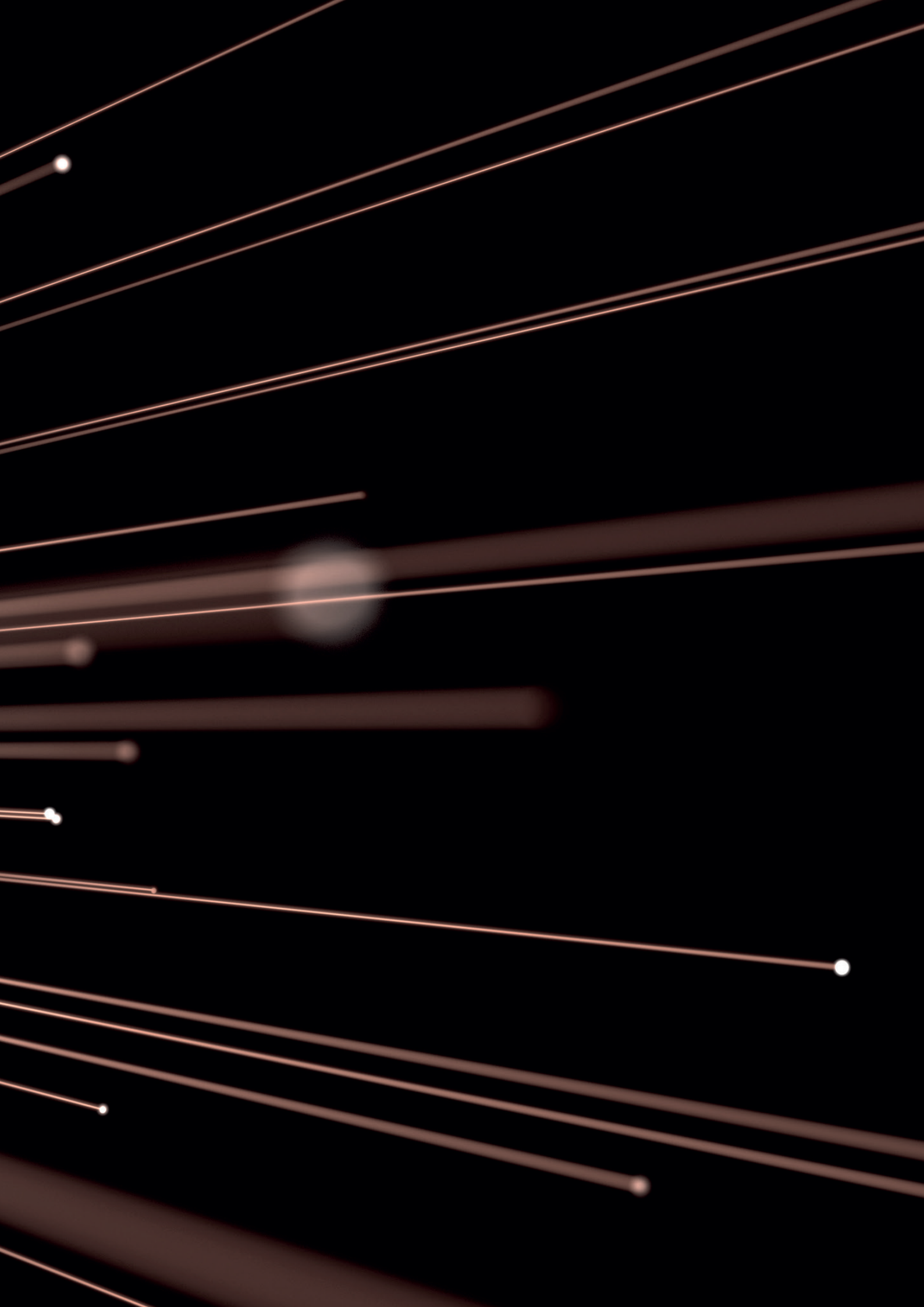
Edition 2020



The background of the image is a dark, almost black, space filled with a dense network of thin, glowing orange and yellow lines. These lines radiate from various points, creating a sense of depth and movement, much like light traveling through fiber optic cables. Interspersed among these lines are numerous small, bright white and yellow circular spots of varying sizes, some of which appear as soft, out-of-focus light sources. The overall effect is one of high-tech, futuristic connectivity and light transmission.

HUBER+SUHNER

Fiber optic cable produced in Switzerland





Connecting – today and beyond

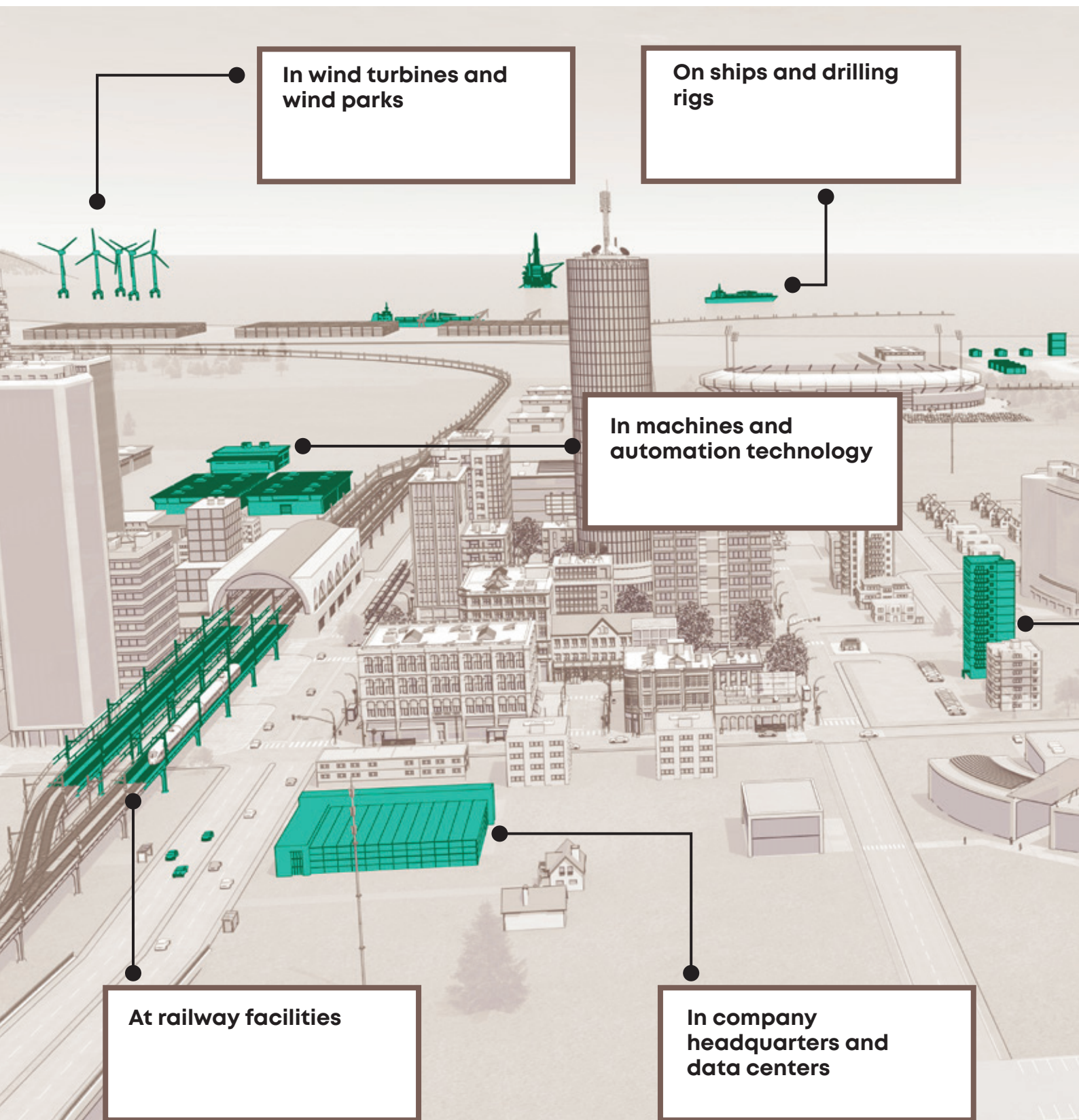


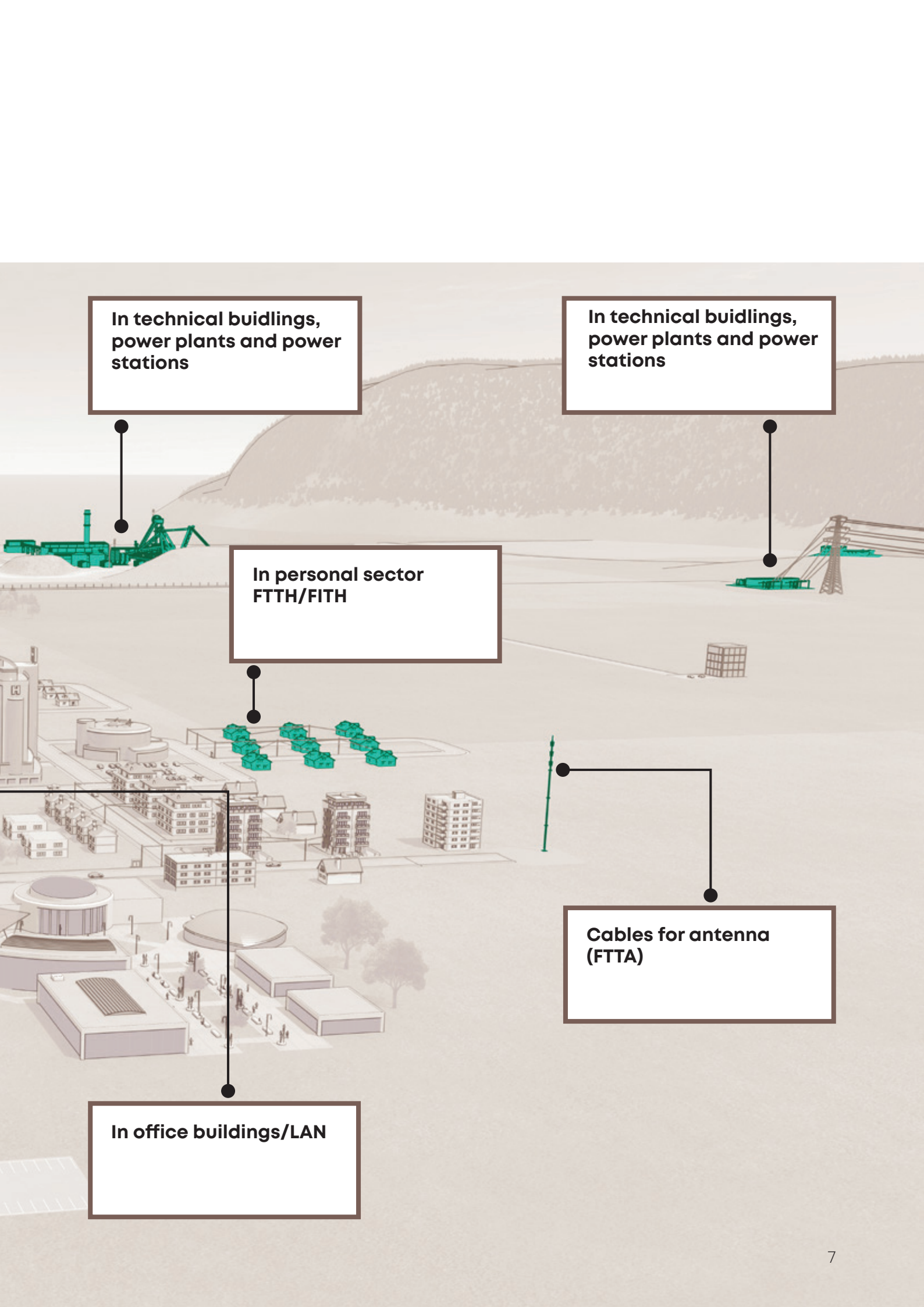
Your partner for system solutions

HUBER+SUHNER is a leading international producer and supplier of electrical and optical interconnectivity components and systems. Core capabilities in radio frequency, fiber optic and low frequency technology are united under a single roof.

HUBER+SUHNER offers a wide range of fibre optical cables, optimised for fix or mobile applications at indoor and outdoor areas. Due to new market demands innovative products are developed and tested according to international standards, which fulfil high mechanical and thermal conditions as well as fire requirements.

Applications



The diagram illustrates various applications of fiber optic technology across different sectors. It features a background illustration of a landscape with a river, hills, and various buildings and infrastructure. Five callout boxes with black borders and white text are connected to specific points in the illustration by black lines. The boxes are: 1. Top left: 'In technical buidlings, power plants and power stations' (note the typo 'buidlings'). 2. Top right: 'In technical buidlings, power plants and power stations' (note the typo 'buidlings'). 3. Center: 'In personal sector FTTH/FITH' (note the typo 'FITH'). 4. Bottom right: 'Cables for antenna (FTTA)'. 5. Bottom left: 'In office buildings/LAN'. The background illustration includes a green industrial facility with smokestacks on the left, a power transmission tower on the right, a cluster of green houses in the center, and various office and commercial buildings at the bottom.

**In technical buidlings,
power plants and power
stations**

**In technical buidlings,
power plants and power
stations**

**In personal sector
FTTH/FITH**

**Cables for antenna
(FTTA)**

In office buildings/LAN

Energy

Ruggedised breakout cables

- Industry Link TWINFLEX
› Page 134



- Industry Link TWINFIX
› Page 136



- Industry Link QUADFIX
› Page 140

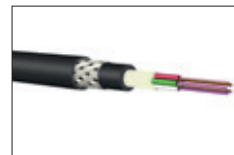


- Rugged minicord breakout cables
› Page 134



Steel-armoured loose tube cables

- › Page 110



HVDC cables

- Simplex
› Page 142



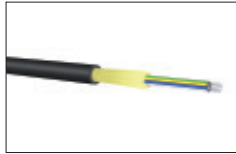
- Breakout
› Page 144



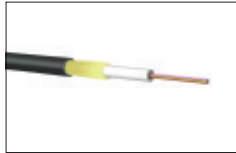
Mining

Mobile field cables

- Riser construction
› Page 148

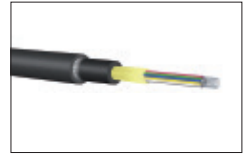


- Loose tube construction
› Page 146

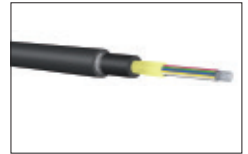


Drag chain cables

- Drag chain cable
› Page 162



- RADOX® drag chain cable
› Page 164



Ruggedised breakout cable

- Rugged minicord breakout cable
› Page 134



Broadcast

Industry Link TWIN-FLEX and rugged minicord breakout cables

- Rugged minicord breakout cable
› Page 134
- Industry Link TWINFLEX
› Page 134

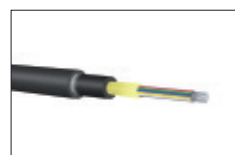


Drag chain cable

- Drag chain cable
› Page 162

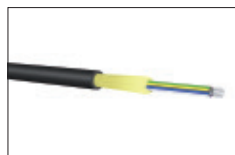


- RADOX® drag chain cable
› Page 164

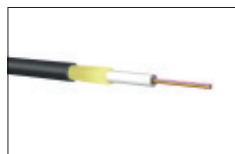


Mobile field cables

- Riser-construction
› Page 148



- Loose tube construction
› Page 146



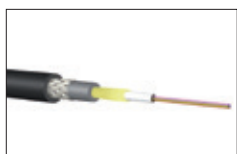
Oil & Gas

Loose tube cables

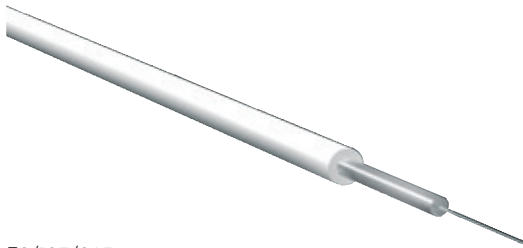
- RADOX® loose tube cable
› Page 160



- Steel-armoured loose tube cable
› Page 160



Specification single-mode fiber



E9/125/245 μm

Optical characteristics single-mode fiber

Conditions			E9/125	E9/125 A1 ¹⁾	E9/125 A2	E9/125 A3
Standards according ITU-T			G.652.D	G.657.A1 ¹⁾	G.657.A2	G.657.A2/B3
Attenuation typical (in cable)	1310 nm	dB/km	≤ 0.33	≤ 0.32	≤ 0.35	≤ 0.35
	1383 nm	dB/km	≤ 0.33	≤ 0.32	≤ 0.35	≤ 0.35
	1550 nm	dB/km	≤ 0.20	≤ 0.20	≤ 0.21	≤ 0.21
	1625 nm	dB/km	≤ 0.22	≤ 0.22	≤ 0.23	≤ 0.23
Attenuation maximum (in cable)	1310 nm	dB/km	≤ 0.40	≤ 0.40	≤ 0.40	≤ 0.40
	1383 nm	dB/km	≤ 0.40	≤ 0.40	≤ 0.40	≤ 0.40
	1550 nm	dB/km	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
	1625 nm	dB/km	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
Cable cut-off wavelength λ_{cc}	standard	nm	≤ 1260	≤ 1260	≤ 1260	≤ 1260
Chromatic dispersion	1285 – 1330 nm	ps/nm $\times$ km	≤ 3.50	≤ 3.50	≤ 3.50	≤ 3.50
	1550 nm	ps/nm $\times$ km	≤ 18	≤ 18	≤ 18	≤ 18
Zero dispersion wavelength λ_0			1300 – 1324	1300 – 1324	1300 – 1324	1300 – 1324
Zero dispersion slope S0 at λ_0			≤ 0.092	≤ 0.092	≤ 0.092	≤ 0.092
Polarisation mode dispersion	link value	ps/ $\sqrt{\text{km}}$	≤ 0.06	≤ 0.04	≤ 0.06	≤ 0.06
	individual	ps/ $\sqrt{\text{km}}$	≤ 0.20	≤ 0.10	≤ 0.20	≤ 0.20
Mode-field diameter	1310 nm	μm	9.2 ± 0.4	9.2 ± 0.4	8.4 – 9.5	8.2 – 9.5
	1550 nm	μm	10.3 ± 0.4	10.3 ± 0.4	9.3 – 10.5	9.2 – 10.5
Group index of refraction typical	1310 nm		1.466	1.466	1.466	1.466
	1550 nm		1.467	1.467	1.467	1.467
Macrobending loss r = 5.0 mm, 1 turn	1550 nm	dB	–	–	–	≤ 0.15
	1625 nm	dB	–	–	–	≤ 0.45
Macrobending loss r = 7.5 mm, 1 turn	1550 nm	dB	–	–	≤ 0.50	≤ 0.08
	1625 nm	dB	–	–	≤ 1.0	≤ 0.25
Macrobending loss r = 10 mm, 1 turn	1550 nm	dB	–	≤ 0.75	≤ 0.1	≤ 0.03
	1625 nm	dB	–	≤ 1.50	≤ 0.2	≤ 0.1
Macrobending loss r = 15 mm, 10 turn	1550 nm	dB	–	≤ 0.10	≤ 0.03	≤ 0.02
	1625 nm	dB	–	≤ 0.50	≤ 0.1	≤ 0.05

Single-mode fibers used for preterminated indoor cable fulfils standard ITU-G.652.D and ITU-G.657.A1.

¹⁾ For cables with semi-tight and tight tubes: 1310 nm ≤ 0.40 dB/km
1550 nm ≤ 0.30 dB/km
1625 nm ≤ 0.50 dB/km

Geometrical characteristics

		E9/125	E9/125 A1	E9/125 A2	E9/125 A3
Cladding diameter	μm	125 ± 0.7			
Coating diameter (uncoloured)	μm	242 ± 7			
Concentricity error core/cladding	μm	≤ 0.5			
Concentricity error cladding/coating	μm	≤ 12.0			
Cladding non-circularity	%	≤ 0.7			
Coating non-circularity	%	≤ 5			

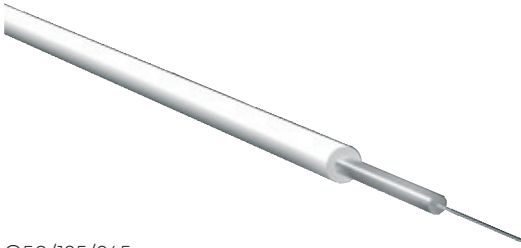
Mechanical and environmental characteristics

		E9/125	E9/125 A1	E9/125 A2	E9/125 A3
Coating material		acrylate			
Tensile proof test (fiber elongation ≤ 1 %)	N (kpsi)	≥ 8.8 (100)			
Operation temperature range –60 to 85 °C	1310, 1550 and 1625 nm	Δ dB/km	≤ 0.05		
Water immersion 23 °C for 30 days	1310, 1550 and 1625 nm	Δ dB/km	≤ 0.05		

Specifications

Standards	E9/125	E9/125 A1	E9/125 A2	E9/125 A3
	– ITU-T G.652.D – IEC 60793-2-50 Typ B-652.D – DIN VDE 0888 Part 3	– ITU-T G.657.A1 – IEC 60793-2-50 Type B-657.A1	– ITU-T G.657.A2 – IEC 60793-2-50 Type B-657.A2	– ITU-T G.657.B3 – IEC 60793-2-50 Type B-657.B3

Specification multimode fiber



G50/125/245 µm

Optical characteristics multimode fiber

Fiber class				G50/125			
Fiber class available by H+S				OM2 standard	OM3 F	OM4 G	OM5*) H
Bandwidth (overfilled launch) min.		850 nm	MHz × km	500	1500	3500	3500
		1300 nm	MHz × km	500	500	500	500
1 Gigabit Ethernet 1000BASE –	SX	850 nm	m	500	1000	1500	
	LX	1300 nm	m	550	550	550	
10 Gigabit Ethernet 10GBASE	SX	850 nm	m	–	300	550	
	LX4	1300 nm	m	–	300	300	
Bending loss at 850/1300 nm	r =	37,5 mm	dB	0.1/0.2 ¹⁾			
	r =	15,0 mm	dB	0.1/0.3 ¹⁾			
	r =	7,5 mm	dB	0.2/0.5 ¹⁾			
Attenuation typical (in cable)		850 nm	dB/km	2.3			
		1300 nm	dB/km	0.5			
Attenuation maximum (in cable)		850 nm	dB/km	≤ 2.7			
		1300 nm	dB/km	≤ 1.0			
Effective group index of refraction		850 nm		1.482			
		1300 nm		1.477			
Numerical aperture				0.200 ± 0.015			

¹⁾ With specified fiber parameters for wave length multiplexing between 850 nm and 950 nm.

¹⁾ OM2, OM3, OM4 and OM5 BendOptimised is a HUBER+SUHNER standard

Geometrical characteristics

Fiber class		G50/125			
		OM2	OM3	OM4	OM5
Core diameter	μm	50 ± 2.5			
Cladding diameter	μm	125 ± 1			
Coating diameter (uncoloured)	μm	242 ± 10			
Concentricity error core/cladding	μm	≤ 1.0			
Core non-circularity	μm	≤ 5			
Cladding non-circularity	%	≤ 1			
Coating non-circularity	%	≤ 5			

Mechanical and environmental characteristics

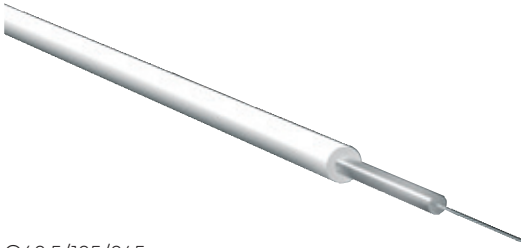
Fiber class		G50/125			
		OM2	OM3	OM4	OM5
Coating material		acrylate			
Tensile proof test at fiber elongation ≤ 1 %	N (kpsi)	≥ 8.8 (100)			
Temperature range max. Δ 0.1 dB/km 850/1300 nm	°C	−60 bis +85			
Water immersion max. Δ 0.2 dB/km 850/1300 nm		23 °C more than 30 days			

Specifications

Fiber class		G50/125			
		OM2	OM3	OM4	OM5
Standards ¹⁾		ITU-T G.651 IEC 60793-2-10			
		A1-OM2b	A1-OM3b	A1-OM4b	A1-OM5b

¹⁾ The suffix „a“ (A1a...) specifies fibers with traditional macrobend loss performance levels; the suffix „b“ (A1a...b) specifies fibers with enhanced macrobend loss performance levels.

Specification multimode fiber



G62.5/125/245 µm

Optical characteristics multimode fiber

Fiber class			G62.5/125	
			OM1	OM2
			standard	D
Bandwidth (overfilled launch) min.		850 nm	MHz × km	200
		1300 nm	MHz × km	500
1 Gigabit Ethernet 1000BASE –	SX	850 nm	m	275
	LX	1300 nm	m	550
Attenuation typical (in cable)		850 nm	dB/km	2.6
		1300 nm	dB/km	0.5
Attenuation maximum (in cable)		850 nm	dB/km	≤ 3
		1300 nm	dB/km	≤ 1.0
Effective group index of refraction		850 nm		1.496
		1300 nm		1.491
Numerical aperture			0.275 ± 0.015	

Geometrical characteristics

Fiber class		G62.5/125	
		OM1	OM2
Core diameter	μm	62.5 ± 3	
Cladding diameter	μm	125 ± 2	
Coating diameter (uncoloured)	μm	245 ± 10	
Concentricity error core/cladding	μm	≤ 1.5	
Core non-circularity	μm	≤ 6	
Cladding non-circularity	%	≤ 1	
Coating non-circularity	%	≤ 6	

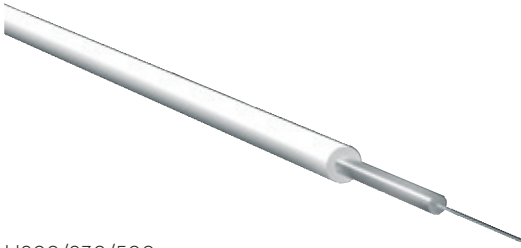
Mechanical and environmental characteristics

Fiber class		G62.5/125	
		OM1	OM2
Coating material		acrylate	
Tensile proof test at fiber elongation ≤ 1 %	N (Kpsi)	≥ 8.8 (100)	
Temperature range max. Δ 0.1 dB/km 850/1300 nm	°C	−60 to +85	
Water immersion max. Δ 0.2 dB/km 850/1300 nm		23 °C more than 30 days	

Specifications

Fiber class		G62.5/125	
		OM1	OM2
Standards		IEC 60793-2-10 A1-OM1	—

Specification multimode fiber



H200/230/500 μm

Optical characteristics multimode step index fiber (HCS)

Fiber class			H200/230/500 μm
Bandwidth (overfilled launch)	850 nm	MHz $\times$ km	≥ 20
Attenuation typical (in cable)	850 nm	dB/km	5
Attenuation maximum (in cable)	850 nm	dB/km	10
Numerical aperture			0.37 ± 0.02

Geometrical characteristics

Fiber class			H200/230/500 μm
Core diameter		μm	200 ± 4
Cladding diameter		μm	$230 + 0/-10$
Coating diameter (uncoloured)		μm	500 ± 30
Concentricity error core/cladding		μm	≤ 5

Mechanical and environmental characteristics

Fiber class			H200/230/500 μm
Coating material			Tefzel
Tensile proof test at a fiber elongation of $\leq 1\%$		N (Kpsi)	≥ 8.8 (100)
Operation temperature range max. $\Delta 0.1$ dB/km 850/1300 nm		$^{\circ}\text{C}$	-65 bis +125

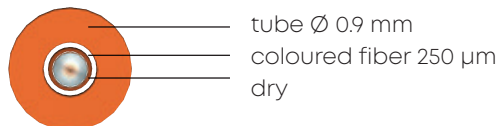
Specifications

Fiber class		H200/230/500 μm
Standards		IEC 60793-2-30 A3c

Terms and definitions

CH-tube (semi-tight tube) without jelly 0.9 mm

Standard tube for pigtails

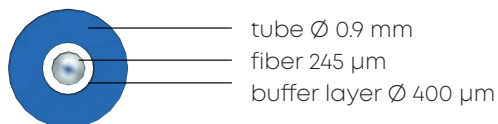


Features

- Easiest stripping up to 2 m
- No cleaning (jelly-free)
- No memory effect
- High kink resistance

F-tube (tight tube) 0.9 mm

For various cable designs, e.g. riser, drag chain

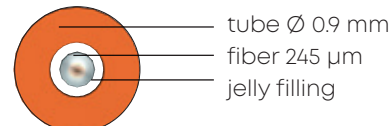


Features

- Mechanically rugged
- Easy stripping approx. 30 mm
- Wide temperature range

CW-tube (semi-tight tube) jelly-filled 0.9 mm

Standard tube for simplex, duplex and breakout cables



Features

- Easiest stripping up to 1 m
- Good thermal and mechanical features
- High flexibility
- Small bending radius

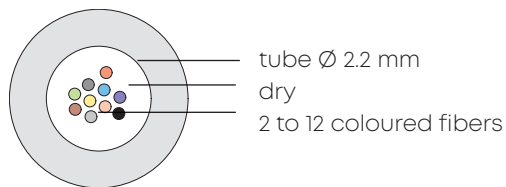
V-tube (tight buffered tube) 0.6 mm



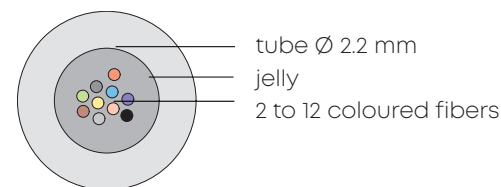
Features

- Easy stripping approx. 30 mm
- Wide temperature range

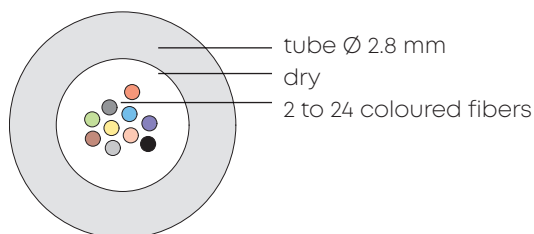
BQ Mini-multi-fiber loose tube, dry/jelly-free cable



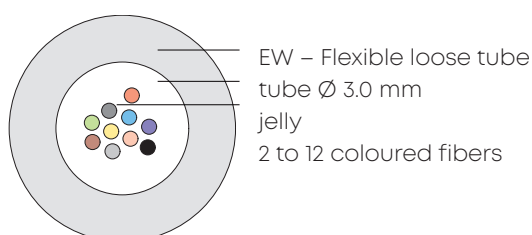
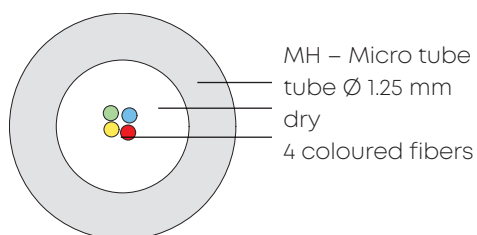
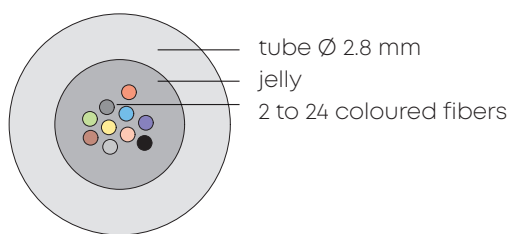
BW Mini-multi-fiber loose tube, jelly-filled



Q Multi-fiber loose tube, dry/jelly-free cable



W Multi-fiber loose tube, jelly-filled



Cable jacket materials

Designation	Polyolefine flame retardant	Polyvinyl-chloride	Polyethylene		Polyurethane flame retardant	Polyurethane	Polybutylen-terephthalate	Thermoplastic elastomer	
Abbreviation	LSFH™	PVC	LDPE	HDPE	PUR/TPU	PUR/TPU	PBT	TPE	RADOX®
HUBER+ SUHNER code	H	T	Y	V	U	Z	N	X	R

Combustion properties

halogen-free	yes	no	yes	yes	yes	yes	yes	yes
Flame retardant	yes	yes	no	yes	no	no	no	yes
Smoke emission	low	strong	low	strong	strong	strong	medium	low
Corrosive gases	low	high	no	low	low	no	no	no

Mechanical properties

Abrasion resistance	low	medium	medium	good	good	good	good	good	medium
Flexibility	high	high	medium	low	high	high	low	medium	medium
Hardness	medium	soft	medium	hard	soft	soft	hard	hard	soft

Resistance against

Oil/fuel ¹⁾	good/satisfactory ²⁾	satisfactory	good / satisfactory	satisfactory	good	good	good	very good
Water	good/satisfactory ²⁾	good	very good	satisfactory	good	satisfactory	satisfactory	very good
Weathering ³⁾	good	good	very good	good	very good	satisfactory	good	very good

Information given in this table is based on plastic materials used for cable jackets. Properties and resistance for cables cannot be derived from it.

¹⁾ This information is meant as decision guidance to the best of our today's knowledge, it is based on typical values. The resistance of cables has to be verified due to the wide variety of oils and fuels.

²⁾ Depending on the cable design different types of LSFH™ materials are used for the cable jacket.

³⁾ The UV resistance depends highly on the colour of the plastic used, black offers the best resistance.

Colour codes

Colour code for fiber

according to standard

Number	Swisscom 1) (H+S standard)	DIN 2)	ANSI/TIA-598	IEC 3)
1	red	red	blue	blue
2	green	green	orange	yellow
3	yellow	blue	green	red
4	blue	yellow	brown	white
5	white	white	gray	green
6	violet	gray	white	violet
7	orange	brown	red	orange
8	black	violet	black	gray
9	gray	turquoise	yellow	turquoise
10	brown	black	violet	black
11	heather violet	orange	heather violet	brown
12	turquoise	heather violet	turquoise	heather violet

multifiber loose tube up to 24 fibers, fiber number 13 to 24 with black ring.

Note: Orders of fiber optic cables with different fiber types (combination SM/MM):
unless otherwise specified, the first colours of the colour code are assigned to the smaller fiber type.
Example of a cable with 4xE9, 8xG50: red, green, yellow, blue = E9 fiber, remaining colours = G50 fiber

Stranding

according to Swisscom ⁴⁾

Multifiber loose tube elements

1	red
2	green
3	weiss 1
4	white 2
5	white 3
...	... etc.
dummies	black

Semi-tight tubes 0.9 mm according to HUBER+SUHNER ⁴⁾

E9/125	yellow
G50/125	orange
G62/125	blue
G50/125 OM3	turquoise
G50/125 OM4	heather violet
G50/125 OM5	lime green

Inscription

standard according to HUBER+SUHNER

xxxxxxx zzzzzz/yy
HUBER+SUHNER FIBEROPTIC . x ... 00000 m

xxxxxxx	item number (8 digits)
zzzzzz	production number (7 digits)
yy	production year
. x ...	amount of fibers x fiber type
00000 m	consecutive numbering

Single-fiber cables according HUBER+SUHNER ⁴⁾

E9/125	yellow
G50/125	orange
G62/125	orange
G50/125 OM3	turquoise
G50/125 OM4	heather violet
G50/125 OM5	lime green

¹⁾ H+S standard, unless otherwise specified

²⁾ DIN VDE 0888 part 3

³⁾ IEC 60794-2

⁴⁾ Standard, unless otherwise specified

HUBER+SUHNER cable code

XXX-										total number of optical fibers in cable, always indicated with two or three digits
1-24										1 to 24 optical fibers per multifiber loose tube
E9/										single-mode fiber 9/125/245 µm
E9A2/										single-mode fiber low bend 9/125/245 µm A2
E9A3/										single-mode fiber low bend 9/125/245 µm A3
G50/										single-mode fiber 9/125/200 µm
G62/										multimode fiber 62.5/125/250 µm
H200/										step-index fiber HCS 200/230/500 µm
F										tight tube 0.9 mm
V										tight tube up to 0.6 mm
CW										semi-tight tube 0.9 mm, jelly-filled
CH										semi-tight tube 0.9 mm, dry
W										multifiber loose tube, jelly-filled Ø 2.80 mm
Q										multifiber loose tube, jelly-free – dry block Ø 2.80 mm
BW										mini multifiber loose tube, jelly-filled Ø 2.20 mm
BQ										mini multifiber loose tube, jelly-free – dry block Ø 2.20 mm
EW										flexible loose tube jelly-filled
MW										micro multifiber loose tube, jelly-filled
MH										micro multifiber loose tube, jelly-free
J										strain relief for each separate optical fiber
SN										central strength member, non-metallic
DN										de-centralised strength member, non-metallic
(ZN)										strain-relief, non-metallic (aramide)
(ZNG)										glass roving for strain relief/rodent protection
A-										steel wire armouring
H-										outer jacket material LSFH™
R-										beam crosslinked (RADOX®)
I-										mica tape (flame barrier)
K-										anti-termite
U-										outer jacket material PUR, flame retardant (FR)
V-										outer jacket material PE (HD-PE)
X-										outer jacket material TPE
Y-										outer jacket material PE (LD-PE)
Z-										outer jacket material PUR
L-										anti-rodent
A										outer jacket figure 0
Δ										colour of outer jacket please refer to cable colour chart
XX										diameter of the cable (1/10 mm)
-xx										options 1 to 5, see next page
02-	12	G50/	CW	J	(ZNG)	H-	M	27	-F	example I
48-		E9/	BQ	SN		H-	G	96		example II

HUBER+SUHNER cable code

Rules

- For cables where each 0.6 or 0.9 mm tube is individually strain relieved (code = J) , the termination diameter is specified. For cables where all tubes have a common strain relief (code = ZN or ZNG) the cable diameter is specified. By individual and common strain relief in the same cable, the termination diameter gets specified.
- The fiber colour is only indicated if not standard
- All options follow the basic code :
basic key – 1st – 2nd – 3rd – 4th option
- The cable code has no spaces
- Items not used are left out

Fiber and cable colours Δ	
A	red
B	green
C	blue
D	orange
E	yellow
F	white
G	black
H	grey
I	brown
K	violet
L	heather violet
M	turquoise
N	light blue
O	ochre-brown
P	purple
Q	yellow-green
R	olive-green
S	lime green
T	transparent
U	nature (milky or beige)
Y	pink
Z	black with orange stripes

1st option: fiber class or bandwidth length-product MHz × km, 850/1300 nm

	G50	G62
Standard without indication	OM2	OM1
-D		OM2: 500/500
-E	OM2: 600/1200	
-F	OM3: 1500/500	
-G	OM4: 3500/500	
-H	OM5 : 3500/500	

Classes please see under section «fiber types»

2nd option: fiber colour

-FA	fiber colours refer to fiber colour chart (1 to 12)
-FAG	fiber colours with ring mating (13 to 24)

3rd option: special information

-UN	UL-listed OFNG: General purpose UL1685
-UR	UL-listed OFNR: Riser cable UL1666
-UP	UL-listed OFNP: Plenum cable UL910

4th option: electrical elements (hybrid cable)

+XX-			number of conductors respectively units
	C		electrical conductor, copper cords
		XX	conductor cross section (1/10 mm ²)
+02-	C	15	example

5th option: CPR classification

#B	Main class B2ca
#C	Main class Cca
#D	Main class Dca
#E	Main class Eca
#F	Main class Fca

DIN/VDE 0888 cable code

Application	A	outdoor cable
	AT	divideable outdoor cable
	I	indoor cable
	U	universal cable
Tube type	B	loose tube jelly-free
	D	loose tube with jelly
	F	fiber
	H	loose tube jelly-free and 1 fiber
	V	tight tube (acc. vde)
	W	loose tube with jelly and 1 fiber
Cable design	B	corrugated steel
	Q	dry and longitudinal watertight
	(ZN)	strain-relief non-metallic
	(ZS)	strain-relief with steel
	I	mica tape/flame barrier
	(SR)	overlapping steel grooved belt
Jacket material	H	acc. LSFH (FRNC, LSOH etc.)
	R	RADOX
	Y	PVC, polyvinylchlorid
	2Y	PE, polyethylene
	4Y	PA, polyamide
	11Y	PUR, polyurethane, rubber-like e.g. for drag chain
Quantity of fiber resp. tube	n	amount of fiber
	n × m	amount of loose tube × amount of fiber per tube
Fiber type	E	single-mode fiber (glass/glass)
	G	multimode graded index fiber (glass/glass)
	S	multimode step index fiber (glass/glass)
	K	PCF, multimode step index fiber (glass/plastic)
	GK	PCF, multimode graded index fiber (glass/plastic)
	P	POF, plastic fiber (plastic/plastic)
Core diameter	µm	diameter (e.g. 9, 50, 62.5, 200, ...)
Cladding diameter	µm	diameter (e.g. 125, 230, ...)
Attenuation	dB/km	attenuation at wave length
Wave length	A	650 nm
	B	850 nm
	F	1300 nm
	H	1550 nm
Bandwidth	MHz × km	bandwidth with MM fibers (POF MHz × 100 m)
	ns/km	at SM fibers also ps/nm × km

Conformity and certificate

RoHS conformity

The HUBER+SUHNER companies aim to comply with all relevant legal requirements at all time. This also holds true for the European Union Directive 2011/65/EU restriction of the use of certain hazardous substances in electrical and electronic equipment commonly referred to as the Restriction of Hazardous Substances Directive or RoHS. We are proud to state that we are able to supply components fully compliant with the RoHS directive.

This directive restricts the use of six hazardous materials: Lead (Pb), Mercury (Hg), Cadmium (Cd), hexavalent Chromium (Cr VI), and two types of brominated flame retardants, Polybrominated Biphenyls (PBB) and Polybrominated Diphenyl Ethers (PBDE) in the manufacture of various types of electronic and electrical equipment to reduce generation of toxic waste from discarded electrical and electronic equipment.

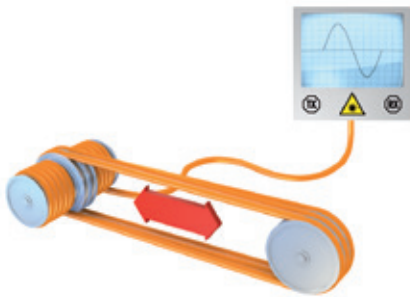


ISO Certificate

High-quality products and supplier relationships have always been a top priority for HUBER+SUHNER. After having already been confirmed by the Swiss forerunner movement, the HUBER+SUHNER quality system was very soon acknowledged by the international ISO quality certificate. This much sought-after certificate according to ISO 9001, which must be earned over and over again, has been awarded to HUBER+SUHNER without interruption since 1990. The fact that HUBER+SUHNER is also prepared to meet specific customer quality standards exceeding those of ISO 9001 is amply proved by a large number of successfully passed customer audits.



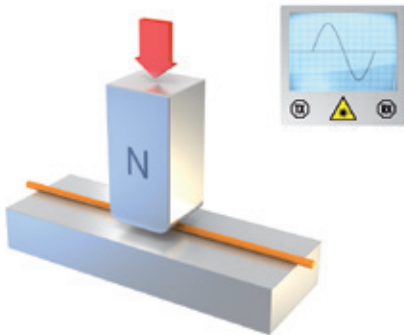
Test procedures



Tensile performance

Examines the behaviour of the attenuation and/or the fiber elongation strain as a function of the load on a cable design which may occur during installation (short term load or maximum specified load for the cable) and operation (long term load). This method is intended to be non-destructive.

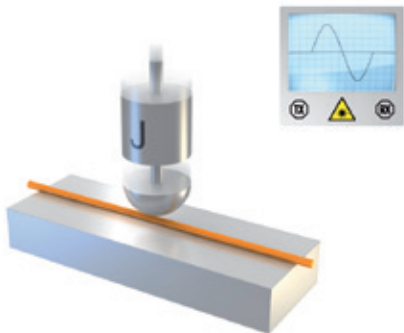
Standards: IEC 60794-1-21 E1 (former IEC 60794-1-2 E1)



Crush resistance

Examines the ability of an optical fiber cable to withstand crushing (transverse compression load) for long term (operation) and for short term (installation) loads. The load is uniformly applied on the cable sample.

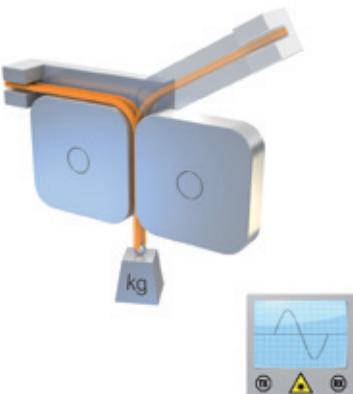
Standards: IEC 60794-1-21 E3 (former IEC 60794-1-2 E3)



Impact

Examines the ability of an optical fiber cable to withstand repeated impacts such as dropping of tools or stones.

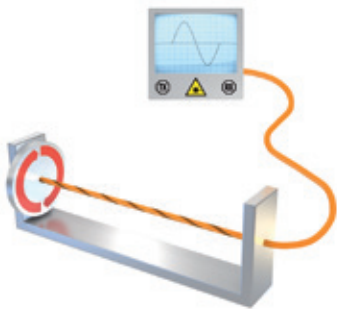
Standards: IEC 60794-1-21 E4 (former IEC 60794-1-2 E4)



Repeated bending

Examines the ability of an optical fiber cable to withstand repeated bending. The stress occurs by repeated bending the cable back and forth by 90°.

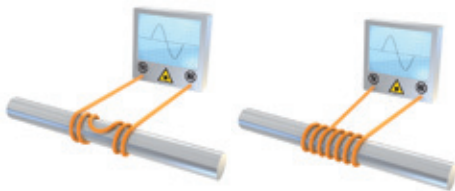
Standards: IEC 60794-1-21 E6 (former IEC 60794-1-2 E6)



Torsion

Examines the ability of a fibre optic cable to withstand mechanical twisting. The primary purpose of this procedure is to measure any variation in the optical power transmittance of a fiber when the cable is subjected to external torsional forces. A secondary purpose is to evaluate the possibility of physical damage that may occur as a result of such stresses.

Standards: IEC 60794-1-21 E7 (former IEC 60794-1-2 E7)



Cable bend

Examines the ability of an optical fiber cable or cable element to withstand bending around a test mandrel.

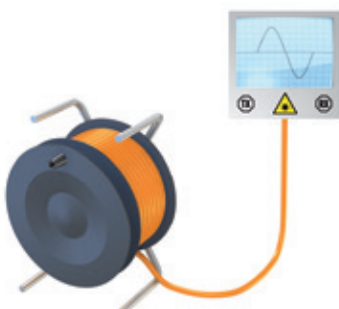
Standards: IEC 60794-1-21 E11 (former IEC 60794-1-2 E11)



Kink

Examines the minimum loop diameter at the onset of the kinking of an optical fiber cable.

Standards: IEC 60794-1-21 E10 (former IEC 60794-1-2 E10)

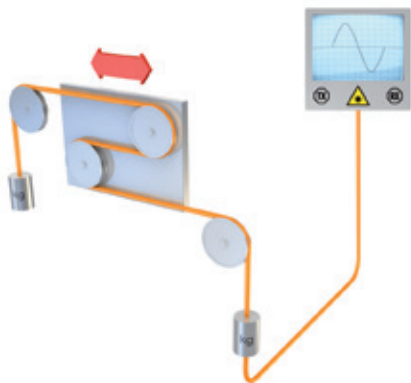


Coiling capability

Shows the ability of a fiber optic cable to withstand winding and unwinding. The purpose is to measure variation of the optical power transmittance of a fiber and to evaluate possible physical damage when the cable is wound and unwound on a reel.

Standards: HUBER+SUHNER

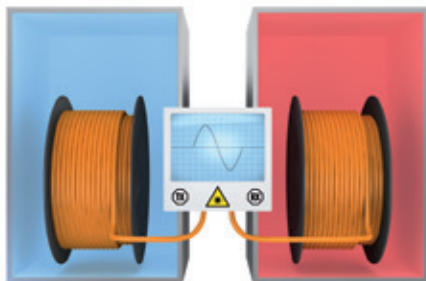
Test procedures



Flexing

Examines the ability of a fiber optic cable to withstand repeated flexing in service. The primary purpose of this procedure is to measure any variation in the optical power transmittance of a fiber when the cable is subjected to external bending and tensional forces. A secondary purpose is to evaluate the possibility of physical damage that may occur as a result of such stresses. This is a specialised test intended for specific types of cable, such as elevator cable or the like.

Standards: IEC 60794-1-21 E8 (former IEC 60794-1-2 E8)



Temperature cycling (change)

Long length cables

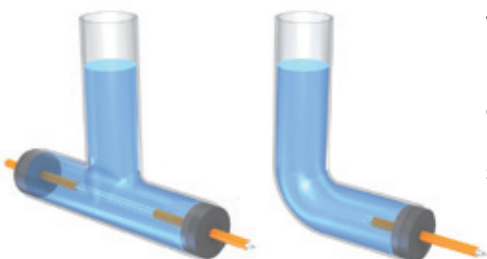
Examines the stability behaviour of the attenuation of cables submitted to temperature changes. Test conditions for temperature-dependent measurements simulate the worst conditions.

Standards: IEC 60794-1-22 F1 (former IEC 60794-1-2 F1)

Short length cables (i.e. cables for patchcords)

Examines the attenuation behaviour (change in attenuation) when optical fibre cables for use in patch cords are subjected to temperature cycling.

Standard: IEC 60794-1-22 F12 (former IEC 60794-2-50 F12)
(IEC 61300-2-22)



method A

method B

Water penetration

Examines the ability of a cable to block water migration along a specified length.

Standards: IEC 60794-1-22 F5A/B/C (former IEC 60794-1-2 F5A/B)

Ageing

Examines the lifetime behaviour of the attenuation of cables, or physical attributes specified in the detail specification.

Standards: IEC 60794-1-22 F10 (former IEC 60794-1-2 F10)



Fire propagation on a vertical single cable

Cables for information transmission inside buildings installed on the surface of walls are a potential source for fire propagation.

A 60 cm long cable is mounted vertically. The flame must extinguish itself and the fire damage must not reach the upper end of sample.

Standards: IEC 60332-1-2
(DIN VDE 0472-804B)
DIN VDE 0482-265

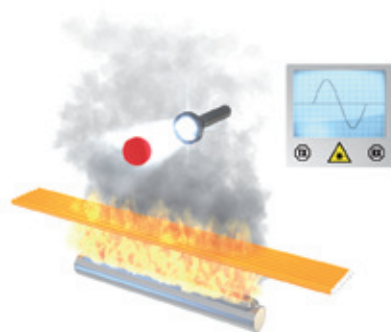


Fire propagation on a vertical cable bundle

Depending on the volume of flammable material the cable bundles are fixed on a 3.5 m long ladder and a test flame is applied at the base during 20 minutes. The height of fire damage must not exceed 2.5 m. This simulates a simplified chimney effect in a cable duct. Cables which pass this test have a improved characteristics regarding fire propagation.

Standards: IEC 60332-3
(DIN VDE 0472-804C)
DIN VDE 0482-260...

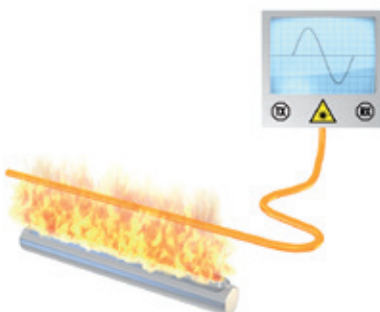
Part (category)	Volume of combustible material [l/m]	Flame application time [min]
—22 (A)	7.0	40
—23 (B)	3.5	40
—24 (C)	1.5	20
—25 (D)	0.5	20



Smoke emission

In a defined test environment the cable is exposed to an open fire of burning alcohol. The smoke density is determined with an optical transmission measurement. This test allows a statement of the expected line-of-sight obstruction in case of fire.

Standards: IEC 61034
(DIN VDE 0472-816)
DIN VDE 0482-268



Fire test with circuit integrity

A test fire is applied horizontally from a distance of 60 cm to a single suspended cable during a specified time. The test is passed when there was continuous circuit integrity and no extremely increased attenuation values during and after the test respectively. For instance FE 90 cables have endured at least 90 minutes, «FE» stands for flame exposure.

This fire test shows the functional integrity duration (minutes) of a mechanically unloaded connection with a flame exposure of minimum 750 °C in a dry environment.

Standards: IEC 60331-25
DIN VDE 0472-814

Test procedures



Measurement of the heat release and smoke production during the flame spread test

The cable bundles will be secured to a 3.5 m ladder to suit the quantity of inflammable material. A test flame acts on the lower end of the cable samples for 20 minutes. The following parameters are measured:

- Smoke production
- Flaming droplets
- Heat release rate
- Total heat release
- Fire growth rate
- Flame spread

The main class and parts of the additional classes are dependent on the measured parameters. Standard: EN 50399

Fire with shock, circuit integrity

In addition to the fire test with circuit integrity, a test flame is applied to a specified test layout and the cable is exposed to mechanical impacts at regular intervals.

This test simulates how many minutes a cable exposed to fire of at least 830 °C and mechanical impacts keeps minimum insulation efficiency (circuit integrity) in a dry environment.

Standards: IEC 60331-1 (former IEC 60331-31)

Corrosive fire gases and free of halogen

Flammable materials are combusted at over 900 °C. Resulting fire gases are washed out in water bottles and the corrosiveness of this solution is determined by means of pH-values and electric conductivity.

Halogen-free products contain hardly any elements of fluorine, chlorine, bromine or iodine. Materials containing halogen can release a considerable quantity of corrosive gases. These gases can cause consequential damage to the surrounding area as well as respiratory problems.

Standards: IEC 60754-1/60754-2
(DIN VDE 0472-813)
(VDE 0482-267)
DIN VDE 0472-815

Construction Products Regulation (CPR)

The Construction Products Regulation¹⁾ defines uniform classification for all cables permanently installed within anytype of building or structure and regulates the conditions for the placing or making available on the European market.

Class	Classification / Test methods	Additional classifications / Test methods					
Aca	Heat of combustion (EN ISO 1716)	—					
B1ca	Heat release, flame spread (EN 50399, EN 60332-1-2)	s1a	Smoke production (EN 50399, EN 61034-2)	d0	Flaming droplets (EN 50399)	a1	Acidity (EN 60754-2)
B2ca		s1b		d1		a2	
Cca		s1		d1		a2	
Dca		s2		d2		a3	
Eca	Flame spread (EN 60332-1-2)	—					
Fca	does not meet Eca	—					



¹⁾ Regulation (EN) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

CPR products

Simplex cable	Product	Reaction to fire				Catalogue page
						
1.7mm simplex cable LSFH material with 0.9mm semi-tight tube (CW-tube)	01-.../CWJH-...17	Dca	sla	d0	a1	48
2.0 mm simplex cable LSFH material with 0.9mm semi-tight tube (CW-tube)	01-.../CWJH-...20	Dca	sla	d0	a1	48
2.4 mm simplex cable LSFH material with 0.9mm semi-tight tube (CW-tube)	01-.../CWJH-...24	Dca	sla	d0	a1	48
2.7 mm simplex cable LSFH material with 0.9mm semi-tight tube (CW-tube)	01-.../CWJH-...27	Dca	sla	d0	a1	48
3.0 mm simplex cable LSFH material with 0.9mm semi-tight tube (CW-tube)	01-.../CWJH-...30	Dca	sla	d0	a1	n/a
1.9 mm simplex cable LSFH material with 0.9mm semi-tight tube (CH-tube)	01-.../CHJH-...19	Cca	sl	d0	a1	50
2.0 mm simplex cable LSFH material with 0.9mm tight tube (F-tube)	01-.../FJH-...20	Dca	sla	d0	a1	n/a
2.7 mm simplex cable LSFH material with 0.9mm tight tube (F-tube)	01-.../FJH-...27	Dca	sla	d0	a1	n/a

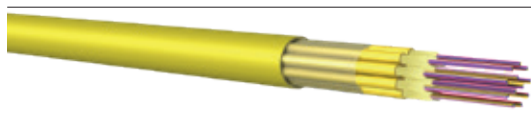
Duplex cable	Product	Reaction to fire				Catalogue page
						
1.7mm duplex fig.8 LSFH material with 0.9mm semi-tight tube (CW-tube)	02-.../CWJH-...17	Dca	sla	d0	a1	52
2.0 mm duplex fig.8 LSFH material with 0.9mm semi-tight tube (CW-tube)	02-.../CWJH-...20	Dca	sla	d0	a1	52
2.7mm duplex fig.8 LSFH material with 0.9mm semi-tight tube (CW-tube)	02-.../CWJH-...27	Dca	sla	d0	a1	52
2.0 mm duplex fig.0 LSFH material with 0.9mm semi-tight tube (CW-tube)	02-.../CWJH-A...20	Dca	sla	d0	a1	54
2.7mm duplex fig.0 LSFH material with 0.9mm semi-tight tube (CW-tube)	02-.../CWJH-A...27	Dca	sla	d0	a1	54
2.1mm duplex uniboot LSFH material with 2 x 0.6 mm tight tube (V-tube)	02-.../VJH-...21	Dca	sla	d0	a1	56

Optipack simplex; harness cable for MPO / MTP®	Product	Reaction to fire				Catalogue page
						
2.0 mm multifiber patch cable LSFH jacket with 12 optical fibers	12-.../(ZN)H-...20	Dca	sla	d0	a1	58
3.0 mm multifiber patch cable LSFH jacket with 12 optical fibers	12-.../(ZN)H-...30	Dca	sla	d0	a1	58
3.0 mm multifiber patch cable LSFH jacket with 24 optical fibers	24-.../(ZN)H-...30	Dca	sla	d0	a1	58
3.6 mm multifiber patch cable LSFH jacket with 24 optical fibers	24-.../(ZN)H-...36	Dca	sla	d0	a1	58

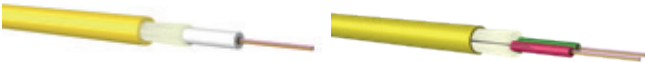
Optipack DJ; ruggedised harness cable for MPO / MTP®	Product	Reaction to fire				Catalogue page
						
2.0 mm multifiber patch cable LSFH jacket with 12 optical fibers	12-.../(ZN)HH-...20	Cca	sla	d0	a1	58
3.0 mm multifiber patch cable LSFH jacket with 24 optical fibers	24-.../(ZN)HH-...30	B2ca	sla	d0	a1	58
3.0 mm multifiber patch cable LSFH jacket with 24 optical fibers	24-.../(ZN)HH-...30	Cca	sla	d0	a1	58

Breakout cable	Product	Reaction to fire				Catalogue page
						
1.4 mm breakout cable LSFH jacket with 8 x 1.4 mm	08-.../VJSNH-...14	Dca	s1a	d0	a1	n/a
1.4 mm breakout cable LSFH jacket with 12 x 1.4 mm	12-.../VJSNH-...14	Dca	s2	d2	a1	62
1.4 mm breakout cable LSFH jacket with 16 x 1.4 mm	16-.../VJSNH-...14	Dca	s1a	d2	a1	62
1.4 mm breakout cable LSFH jacket with 18 x 1.4 mm	18-.../VJSNH-...14	Dca	s1a	d2	a1	n/a
1.4 mm breakout cable LSFH jacket with 24 x 1.4 mm	24-.../VJSNH-...14	B2ca	s1a	d0	a1	62
2.0 mm breakout cable LSFH jacket with 4 x 2.0 mm	04-.../CWJSNH-...20	Dca	s1a	d0	a1	64
2.0 mm breakout cable LSFH jacket with 8 x 2.0 mm	08-.../CWJSNH-...20	Cca	s1a	d2	a1	64
2.0 mm breakout cable LSFH jacket with 12 x 2.0 mm	12-.../CWJH-...20	Cca	s1a	d2	a1	64
2.0 mm breakout cable LSFH jacket with 24 x 2.0 mm	24-.../CWJH-...20	B2ca	s1a	d1	a1	64

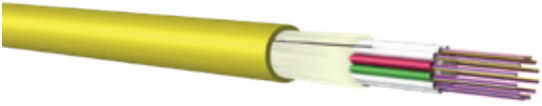
FTTH / FITH indoor cable	Product	Reaction to fire				Catalogue page
						
2.3 mm mini-indoor cable LSFH jacket with 4 x E9 low bend	04-.../MH(ZN)H-...23	Dca	s1a	d0	a1	76
2.8 mm mini-indoor cable LSFH jacket with 4 x E9 low bend 0.6 mm	04-.../V(ZN)H-...28	Dca	s1a	d0	a1	78
4.2 mm FTTH cable LSFH jacket with 4 x E9 low bend, 0.9mm semi-tight tube (CW-tube)	04-.../CWSN(ZN)H-...42	Dca	s1a	d0	a1	n/a

Optipack breakout; trunk cable for MPO/MTP	Product	Reaction to fire				Catalogue page
						
Optipack breakout 2.0 mm LSFH jacket up to 4 x 12 optical fiber	48-12.../(ZN)SNH-...20	B2ca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 4 x 12 optical fiber	48-12.../(ZN)SNH-...20	Cca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 6 x 12 optical fiber	72-12.../(ZN)SNH-...20	B2ca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 6 x 12 optical fiber	72-12.../(ZN)SNH-...20	Cca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 8 x 12 optical fiber	96-12.../(ZN)SNH-...20	B2ca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 8 x 12 optical fiber	96-12.../(ZN)SNH-...20	Cca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 12 x 12 optical fiber	144-12.../(ZN)SNH-...20	B2ca	s1a	d0	a1	68
Optipack breakout 2.0 mm LSFH jacket up to 12 x 12 optical fiber	144-12.../(ZN)SNH-...20	Cca	s1a	d0	a1	68
Optipack breakout 3.0 mm LSFH jacket up to 4 x 12 optical fiber	48-12.../(ZN)SNH-...30	B2ca	s1a	d0	a1	n/a
Optipack breakout 3.0 mm LSFH jacket up to 12 x 12 optical fiber	144-12.../(ZN)SNH-...30	B2ca	s1b	d0	a1	n/a
Optipack breakout 3.0 mm LSFH jacket up to 4 x 24 optical fiber	96-24.../(ZN)SNH-...30	B2ca	s1a	d0	a1	70
Optipack breakout 3.0 mm LSFH jacket up to 4 x 24 optical fiber	96-24.../(ZN)SNH-...30	Cca	s1a	d0	a1	70
Optipack breakout 3.0 mm LSFH jacket up to 6 x 24 optical fiber	144-24.../(ZN)SNH-...30	B2ca	s1a	d0	a1	70
Optipack breakout 3.0 mm LSFH jacket up to 6 x 24 optical fiber	144-24.../(ZN)SNH-...30	Cca	s1a	d0	a1	70
Optipack breakout 3.0 mm LSFH jacket up to 12 x 24 optical fiber	288-24.../(ZN)SNH-...30	B2ca	s1a	d0	a1	70
Optipack breakout 3.0 mm LSFH jacket up to 12 x 24 optical fiber	288-24.../(ZN)SNH-...30	Cca	s1a	d0	a1	70

CPR products

Loose tube construction with rodent protection up to 24 optical fibers dry blocker jelly-free	Product	Reaction to fire					Catalogue page
							
Central loose tube cable 7.0 mm LSFH coloured up to 24 optical fibers (dry blocker)	24-24.../Q(ZNG)H-...70	Cca	s1a	d0	a1		90
Central loose tube cable 7.0 mm LSFH coloured up to 24 optical fibers (dry blocker)	24-24.../Q(ZNG)H-...70	Dca	s1a	d2	a1		90
Central loose tube cable 8.5 mm LSFH coloured up to 24 optical fibers (dry blocker)	24-24.../Q(ZNG)H-...85	Dca	s1a	d2	a1		90
Central loose tube cable 12.0 mm LSFH coloured up to 24 optical fibers (dry blocker)	24-24.../Q(ZNG)H-...120	B2ca	s1a	d0	a1		92
TWINTUBE loose tube cable 8.8 mm LSFH coloured up to 2 x 12 optical fibers jelly-free (dry blocker)	24-12.../BQ(ZNG)H-...88	Cca	s1a	d0	a1		94
TWINTUBE loose tube cable 9.4 mm LSFH coloured up to 2 x 12 optical fibers jelly-free (dry blocker)	48-24.../Q(ZNG)H-...94	Dca	s1a	d2	a1		94

Loose tube construction with rodent protection up to 24 optical fibers dry blocker jelly-filled	Product	Reaction to fire					Catalogue page
							
Central loose tube cable 7.0 mm LSFH up to 24 optical fibers	24-24.../W(ZNG)H-...70	Dca	s2	d1	a1		102
Central loose tube cable 8.5 mm LSFH up to 24 optical fibers	24-24.../W(ZNG)H-...85	Dca	s1a	d0	a1		102
Central loose tube cable 8.5 mm RADOX up to 24 optical fibers	24-24.../W(ZNG)R-...85	Dca	s1a	d0	a1		156
TWINTUBE loose tube cable 9.4 mm LSFH up to 2 x 12 optical fibers	48-24.../W(ZNG)H-...94	Dca	s2	d2	a1		104

Loose tube cable with rodent protection up to 144 optical fibers (stranded construction) dry blocker jelly-free	Product	Reaction to fire				Catalogue page
						
Stranded loose tube cable 10.0 mm LSFH up to 48 optical fibers dry blocker	48-.../BQSN(ZNG)H-...100	Cca	s1a	d0	a1	96
Stranded loose tube cable 9.6 mm LSFH up to 48 optical fibers dry blocker	48-.../BQSN(ZNG)H-...96	Dca	s1a	d0	a1	98
Stranded loose tube cable 11.0 mm LSFH up to 72 optical fibers dry blocker	72-.../BQSN(ZNG)H-...110	Cca	s1a	d0	a1	96
Stranded loose tube cable 10.6 mm LSFH up to 72 optical fibers dry blocker	72-.../BQSN(ZNG)H-...106	Dca	s2	d0	a1	98
Stranded loose tube cable 12.6 mm LSFH up to 96 optical fibers dry blocker	96-.../BQSN(ZNG)H-...126	Cca	s1a	d0	a1	96
Stranded loose tube cable 12.2 mm LSFH up to 96 optical fibers dry blocker	96-.../BQSN(ZNG)H-...122	Dca	s2	d0	a1	98
Stranded loose tube cable 15.0 mm LSFH up to 144 optical fibers dry blocker	144-.../BQSN(ZNG)H-...150	Cca	s1b	d0	a1	96
Stranded loose tube cable 14.5 mm LSFH up to 144 optical fibers dry blocker	144-.../BQSN(ZNG)H-...145	Eca				98

Loose tube cable with rodent protection up to 48 optical fibers (stranded construction) jelly-filled	Product	Reaction to fire				Catalogue page
						
Stranded loose tube cable 9.6 mm LSFH up to 48 optical fibers	48-.../BWSN(ZNG)H-...96	Dca	s1a	d0	a1	106

Ruggedised breakout cable	Product	Reaction to fire				Catalogue page
						
Ruggedised breakout cable 7.5 mm LSFH simplex cable 2 x 2.2 mm	02-.../FJ(ZNG)H-...22	Dca	s1a	d0	a1	136
Ruggedised breakout cable 9.0 mm LSFH simplex cable 4 x 2.2 mm	04-.../FJSN(ZNG)H-...22	Cca	s1a	d0	a1	140

Glass-armoured riser cable	Product	Reaction to fire				Catalogue page
						
Glass-armoured riser cable 4.8 mm tight tube	02-.../F(ZNG)H-...48	Dca	s2	d0	a1	150
Glass-armoured riser cable 5.5 mm tight tube	02-.../F(ZNG)H-...55	Dca	s1a	d0	a1	150
Riser cable 6.0 mm tight tube	02-.../FSN(ZN)H-G60	Dca	s1a	d0	a1	n/a
Glass-armoured riser cable 7.0 mm tight tube	02-.../F(ZNG)H-...70	Dca	s1a	d1	a1	150

DNV GL products

Breakout cable	Product	Approval	Catalogue page
			
2.0 mm breakout cable LSFH jacket with 4 x 2.0 mm	04-.../CWJSNH-...20	TAE 000010R	64
2.0 mm breakout cable LSFH jacket with 8 x 2.0 mm	08-.../CWJSNH-...20	TAE 000010R	64
2.0 mm breakout cable LSFH jacket with 12 x 2.0 mm	12-.../CWJSNH-...20	TAE 000010R	64
2.0 mm breakout cable LSFH jacket with 24 x 2.0 mm	24-.../CWJSNH-...20	TAE 000010R	64

Fire resistant breakout cable	Product	Approval	Catalogue page
			
2.0 mm fire resistant breakout cable LSFH jacket with 4 x 2.0 mm	04-.../CWJSNHIH-...20	TAE 0000192	66
2.0 mm fire resistant breakout cable LSFH jacket with 8 x 2.0 mm	08-.../CWJSNHIH-...20	TAE 0000192	66
2.0 mm fire resistant breakout cable LSFH jacket with 12 x 2.0 mm	12-.../CWJSNHIH-...20	TAE 0000192	66

Central loose tube cable rodent protected up to 24 optical fibers	Product	Approval	Catalogue page
			
Central loose tube cable Glass-armoured 12.0 mm LSFH up to 24 optical fibers	24-24.../W(ZNG)H-...120	TAE 0000172	160
Central loose tube cable Steel-armoured 8.2 mm RADOX up to 24 optical fibers	24-24.../W(ZN)HAR-...82	TAE 0000173	160

UL products

Glass-armoured riser cable	Product	Approval	Catalogue page
			
Glass-armoured riser cable 4.8 mm tight tube	02-.../F(ZNG)H-...48	OFNR	150
Glass-armoured riser cable 5.5 mm tight tube	02-.../F(ZNG)H-...55	OFNR	150
Glass-armoured riser cable 7.0 mm tight tube	02-.../F(ZNG)H-...70	OFNR	150

Ruggedised breakout cable	Product	Approval	Catalogue page
			
Ruggedised breakout cable 7.5 mm LSFH simplex cable 2 x 2.2 mm	02-.../FJ(ZNG)H-...22	OFN	136
Ruggedised breakout cable 9.0 mm LSFH simplex cable 4 x 2.2 mm	04-.../FJSN(ZNG)H-...22	OFN	140

Central loose tube cable with rodent protection up to 24 optical fibers	Product	Approval	Catalogue page
			
Cental loose tube cable 7.0 mm LSFH up to 24 optical fibers dry blocker	24-24.../Q(ZNG)H-...70	OFNR	90
Cental loose tube cable 8.5 mm LSFH up to 24 optical fibers	24-24.../W(ZNG)H-...85	OFNR	92

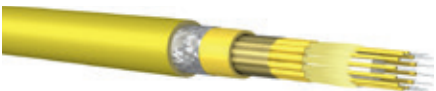
Indoor cables

	Cable type	Page	Ordering key	Weight kg/km	Number of fibers
	Semi-tight tubes 0.9 mm	42	01-.../CH-...9	0.8	1
	Tight tubes 0.9 mm	44	01-.../F-...9	0.8	1
	Tight tubes 0.6 mm	46	01-.../V-T6-...	0.3	1
	Simplex	48	01-.../VJH-...14 01-.../CWJH-...17 01-.../CWJH-...20 01-.../CWJH-...24 01-.../CWJH-...27	2.0 3.0 4.0 5.3 7.0	1 1 1 1 1
	Simplex according DTAG specification	50	01-.../CHJH-...19 01-.../CHJH-...24	3.7 5.3	1 1
	Duplex figure 8 (Zip cord)	52	02-.../VJH-...14 02-.../FJH-...17 02-.../CWJH-...17 02-.../CWJH-...20 02-.../CWJH-...27	4.4 6.5 6.6 9.0 14.3	2 2 2 2 2
	Duplex figure 0	54	02-.../VJH-A-...14 02-.../CWJH-A-...20 02-.../CWJH-A-...27	9.4 19 24	2 2 2
	Duplex round	56	02-.../V(ZN)H-...21	4.3	2
	Optipack	58	12-.../(ZN)H-...20 12-.../(ZN)H-...30 24-.../(ZN)H-...30 24-.../(ZN)H-...36	3.6 8.0 8.3 11.0	8 od. 12 8 od. 12 24 24
	Breakout 1.4 mm	60	08-.../(ZN)HH-...20 12-.../(ZN)HH-...20 24-.../(ZN)HH-...30	23 23 32	8 12 24
	Breakout 2.0 mm	62	12-.../VJSNH-...14 16-.../VJSNH-...14 24-.../VJSNH-...14	83 76 105	12 16 24

p = passed

Tube Ø mm	Ø Single-fiber cable mm	Jacket Ø mm	Jacket material	Direct connec- tor assembly	Tensile strength N	Crush resis- tance N/dm	Temperature range in service °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
0.9		0.9	LSFH™	•	20	1000	-25 to +75			
0.9		0.9	TPE	•	20	1000	-40 to +80			
0.6		0.6	acrylate	•	20	500	-40 to +85			
0.6 0.9 0.9 0.9 0.9		1.4 1.7 2.0 2.4 2.7	LSFH™ LSFH™ LSFH™ LSFH™ LSFH™	• • • • •	150 150 400 400 400	2000 3000 3000 5000 5000	-25 to +70 -25 to +70 -25 to +70 -25 to +70 -10 to +70	p p p p p	p p p p p	Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1
0.9 0.9		1.9 2.4	LSFH LSFH	* *	200 400	1500 7000	-25 to +70 -20 to +70	p p		Dca-s1a, d0, a1
0.6 0.9 0.9 0.9 0.9	1.4 1.7 1.7 2.0 2.7	1.4 × 3.0 1.7 × 3.5 1.7 × 3.5 2.0 × 4.1 2.7 × 5.5	LSFH™ LSFH™ LSFH™ LSFH™ LSFH™	• • • • •	300 300 300 800 800	7500 10 000 4000 6000 10 000	-25 to +70 -40 to +70 -25 to +70 -25 to +70 -25 to +70	p p p p p	p p p p p	Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1
0.6 0.9 0.9	1.4 2.0 2.7	2.3 × 3.7 3.1 × 5.2 3.5 × 6.2	LSFH™ LSFH™ LSFH™	• • •	300 800 800	9000 7000 10 000	-25 to +70 -25 to +70 -25 to +70	p p p	p p p	Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1
0.6		2.1	LSFH™	•	200	5000	-25 to +70	p	p	Dca-s1a, d0, a1
		2.0 3.0 3.0 3.6	LSFH™ LSFH™ LSFH™ LSFH™	• • • •	200 200 500 500	1000 1000 5000 5000	-10 to +60 -10 to +60 -20 to +70 -20 to +70	p p p p	p p p p	Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s1a, d0, a1
	2.0 2.0 3.0	4.3 4.3 4.9	LSFH LSFH LSFH	* * *	500 500 500	2000 2000 2000	-25 to +70 -20 to +70 -20 to +70	p p p	n/a	Cca-s1a, d0, a1 Cca-s1a, d0, a1 B2ca-s1a, d0, a
0.6 0.6 0.6	1.4 1.4 1.4	9.0 9.0 10.6	LSFH™ LSFH™ LSFH™	• • •	3000 4000 5000	12 000 12 000 9000	-25 to +70 -25 to +70 -25 to +70	p p p	p p p	Dca-s2, d2, a1 Dca-s1a, d2, a1 Cca-s1a, d1, a1

Indoor cables (continuance)

	Cable type	Page	Ordering key	Weight kg/km	Number of fibers
	Breakout 2.0 mm	64	04-.../CWJSNH-...20 08-.../CWJSNH-...20 12-.../CWJSNH-...20 24-.../CWJSNH-...20	48 77 146 190	4 8 12 24
	Fire resistant breakout	66	04-.../CWJSNHIH-...20 08-.../CWJSNHIH-...20 12-.../CWJSNHIH-...20	108 147 216	4 8 12
	Optipack breakout – 12	68	24/48-.../(ZN)SNH-...20 72-.../(ZN)SNH-...20 96-.../(ZN)SNH-...20 144-.../(ZN)SNH-...20	44 58 80 93	24/48 72 96 144
	Optipack breakout – 24	70	48/96-.../(ZN)SNH-...30 144-.../(ZN)SNH-...30 288-.../(ZN)SNH-...30	76.5 110.5 143	48/96 144 288
	Riser	72	04-.../FSN(ZN)H-...50 12-.../FSN(ZN)H-...70 24-.../FSN(ZN)H-...88	28 52 77	4 12 24
	FTTH simplex	74	01-E9A2/CWJH-...27-FG	7	1
	FTTH microtube	76	04-E9A2/MH(ZN)H-...23	4.7	4
	FTTH indoor	78	04-E9A2/V(ZN)H-...28	8	4
	FTTH indoor HOMESTAR	80	01-E9A./F(ZN)H-...48 02-E9A./FSN(ZN)H-...48 04-E9A./FSN(ZN)H-...48	25 25 25	1 2 4

p = passed

Tube Ø mm	Ø Single-fiber cable mm	Jacket Ø mm	Jacket material	Direct connec- tor assembly	Tensile strength N	Crush resis- tance N/dm	Temperature range in service °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
0.9	2.0	7	LSFH™	•	1200	7500	-25 to +70	p	p	Dca-s1a, d0, a1
0.9	2.0	9	LSFH™	•	2400	7500	-25 to +70	p	p	Cca-s1a, d2, a1
0.9	2.0	12	LSFH™	•	4000	7500	-25 to +70	p	p	Cca-s1a, d2, a1
0.9	2.0	14	LSFH™	•	7200	4000	-25 to +70	p	p	Cca-s1a, d1, a1
0.9	2.0	10.0	LSFH™	•	1200	4000	-25 to +70	p	p	
0.9	2.0	12.0	LSFH™	•	2400	4000	-25 to +70	p	p	
0.9	2.0	15.0	LSFH™	•	4000	4000	-25 to +70	p	p	
	2.0	6.6	LSFH™	•	600	5000	-10 to +60	p	p	*/**
	2.0	7.6	LSFH™	•	800	5000	-10 to +60	p	p	
	2.0	9.2	LSFH™	•	1000	5000	-10 to +60	p	p	*/**
	2.0	10.3	LSFH™	•	1400	5000	-10 to +60	p	p	
	3.0	9.3	LSFH™	•	600	5000	-10 to +60	p	p	*/**
	3.0	11.0	LSFH™	•	800	5000	-10 to +60	p	p	
	3.0	13.5	LSFH™	•	1400	5000	-10 to +60	p	p	*/**
0.9		5.0	LSFH™	•	1200	18 000	-20 to +70	p	p	Dca-s2, d0, a1
0.9		7.0	LSFH™	•	3000	18 000	-20 to +70	p	p	
0.9		8.8	LSFH™	•	4500	15 000	-20 to +70	p	p	
0.9		2.7	LSFH™	•	400	7000	-25 to +70	p	p	Dca-s1a, d0, a1
		2.3	LSFH™	•	400	5000	-20 to +70	p	p	Dca-s1a, d0, a1
0.6		2.8	LSFH™	•	400	2000	-40 to +70	p	p	Dca-s1a, d0, a1
0.9		4.8	LSFH™	•	400	20 000	-25 to +70	p		
0.9		4.8	LSFH™	•	500	15 000	-25 to +70	p		
0.9		4.8	LSFH™	•	500	10 000	-25 to +70	p		

* B2ca-s1a, d0, a1

** Cca-s1a, d0, a1

Semi-tight tubes 0.9 mm



Properties

- Metal-free indoor cable
- For direct connector assembly
- Tube can be stripped up to 2 m in one piece
- Tight bending radii
- High flexibility
- Halogen-free and non-corrosive fire gases
- Jacket material according to UL 94V-0
- Jelly-free, dry

Applications

- Pigtail assemblies for fusion or mechanical splicing within distribution frames and termination boxes
- Mini patch cables within protected enclosures
- For termination with passive optical components such as connectors

Design

Tube	coloured fiber in dry tube (jelly free)	
Tube material	halogen-free (LSFH)	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	blue
	other colours on request	

According to IEC 60794-1-2

Ordering information

01-.../CH-...9	H-... 1/125
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Please see page 168.

Specification		Semi-tight tube dry	
Tube Ø	mm	0.9	
Approx. weight	kg/km	0.8	

Mechanical properties				
Tensile strength	during installation	N	20	IEC 60794-1-2 E1
	in service	N	10	
Min. bend radius ¹⁾	during installation	mm	25	IEC 60794-1-2 E11
	in service	mm	25	
Crush resistance	short-term	N/dm	1000	IEC 60794-1-2 E3
	long-term	N/dm	500	
Impact resistance	Wp = 0.74 J	impact	3	IEC 60794-1-2 E4
Kink resistance	r = 5 mm		passed	IEC 60794-1-2 E10
Torsion	± 360°, length = 1000 mm, F = 5 N	cycles	3	IEC 60794-1-2 E7

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-25 to +75	
	in storage	°C	-40 to +75	

Combustion properties			
Fire load	MJ/m	0.02	
2011/65/EC (RoHS)		compliant	

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Tight tubes 0.9 mm



Properties

- Metal-free indoor cable
- For direct connector assembly
- Tube can be stripped up to 30 mm in one piece
- Tight bending radii
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Improved crush resistance

Applications

- Patch cable within distribution frames and termination boxes
- In thermally and mechanically critical environments
- For mobile or flexible systems

Design

Tube	buffer layer on fiber	
Tube material	halogen-free (TPE)	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	blue
	other colours on request	

According to IEC 60794-1-2

Ordering information

01-.../F-...9	H-... 1/125
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Please see page 168.

Specification		Tight tube
Tube Ø	mm	0.9
Approx. weight	kg/km	0.8

Mechanical properties				
Tensile strength	during installation (r ≥ 25 mm)	N	20	IEC 60794-1-2 E1
	in service (r ≥ 25 mm)	N	10	
Min. bend radius ¹⁾	during installation	mm	25	IEC 60794-1-2 E11
	in service	mm	25	
Crush resistance	short-term	N/dm	1000	IEC 60794-1-2 E3
	long-term	N/dm	500	
Impact resistance	Wp = 0.74 J, r = 25 mm	Schläge	100	IEC 60794-1-2 E4
Torsion	± 7200°, length = 1000 mm, F = 5 N	cycles	3	IEC 60794-1-2 E7

Thermal properties				
Temperature range	during installation	°C	-10 to +60	IEC 60794-1-22 F12
	in service	°C	-40 to +85	
	in storage	°C	-40 to +60	

Combustion properties			
Fire load	MJ/m	0.02	
2011/65/EC (RoHS)		compliant	

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Tight tubes 0.6 mm



Properties

- Metal-free indoor cable
- For direct connector assembly
- Tube can be stripped up to 30 mm in one piece
- Tight bending radii
- For high thermal stability
- Halogen-free and non-corrosive fire gases

Applications

- Data cable in distribution network – FTTH
- Installation in indoor area

Design

Tube	coloured fiber with a transparent buffer layer	
Tube material	acrylat	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	blue
	other colours on request	

According to IEC 60794-1-2

Ordering information

01-.../V-T6-...	H-... 1/125
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Please see page 168.

Specification		Tight tube	
Tube Ø	mm	0.6	
Approx. weight	kg/km	0.3	

Mechanical properties				
Tensile strength	during installation	N	20	IEC 60794-1-2 E1
	in service	N	10	
Min. bend radius ¹⁾	during installation	mm	25	IEC 60794-1-2 E11
	in service	mm	25	
Crush resistance	short-term	N/dm	500	IEC 60794-1-2 E3
	long-term	N/dm	250	

Thermal properties				
Temperature range	during installation	°C	-10 to +60	IEC 60794-1-22 F12
	in service	°C	-40 to +85	
	in storage	°C	-40 to +60	

Combustion properties		
Fire load	MJ/m	0.007
2011/65/EC (RoHS)		compliant

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Simplex cables



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Tight bending radii
- High flexibility
- Halogen-free and non-corrosive fire gases
- Jacket material according to UL 94V-0
- Low fire load for high safety requirements

Applications

- Patch cables for data centers
- Installation in indoor area
- Measurement cable withstanding mechanical loading
- Data cable in distribution centres
- Strain-relieved pigtail
- Ideal for applications involving safety requirements in case of fire

Design

Tube	tight buffered tube 0.6 mm, stripped up to 30 mm semi-tight tubes 0.9 mm, stripped up to 1 m	
Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

01-.../VJH-...14	I-V(ZN)H - 1.../125
01-.../CWJH-...17	I-W(ZN)H - 1.../125
01-.../CWJH-...20	I-W(ZN)H - 1.../125
01-.../CWJH-...24	I-W(ZN)H - 1.../125
01-.../CWJH-...27	I-W(ZN)H - 1.../125

Please see page 168, 169.

Specification							
CPR main class			Dca	Dca	Dca	Dca	
Jacket Ø	mm	1.4	1.7	2.0	2.4	2.7	
Tube Ø	mm	0.6	0.9	0.9	0.9	0.9	
Approx weight	kg/km	2.0	3.0	4.0	5.3	7.0	

Mechanical properties								
Tensile strength	during installation	N	150	150	400	400	400	IEC 60794-1-2 E1
	in service	N	100	100	200	200	200	
Min. bend radius ¹⁾	during installation	mm	25	50	50	50	50	IEC 60794-1-2 E11
	in service	mm	25	25	25	25	25	
Crush resistance	short-term	N/dm	2000	3000	3000	5000	5000	IEC 60794-1-2 E3
	long-term	N/dm	500	1000	1000	1000	1000	
Impact resistance	Wp = 0.5 J Wp = 0.74 J Wp = 1.0 J	impacts	10	3	3	10	20	IEC 60794-1-2 E4
Repeated bending	r = 25 mm	cycles	1000	5000	5000	1000	5000	IEC 60794-1-2 E6

Thermal properties								
Temperature range	during installation	°C	-10 to +50	-10 to +50	-10 to +50	-10 to +50	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-25 to +70	-25 to +70	-25 to +70	-25 to +70	-10 to +70	
	in storage	°C	-40 to +70	-40 to +70	-40 to +70	-40 to +70	-40 to +70	

Combustion properties								
Fire load		MJ/m	0.05	0.08	0.10	0.15	0.17	
Fire propagation	on vertical single cable			p	p	p	p	IEC 60332-1-2
	on vertical cable bundle				p	p	p	IEC 60332-3-25
Smoke density			p	p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	p	IEC 60754-1
Degree of acidity passed	jacket material		p	p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant					
(EU) No 305/2011 (CPR)				Dca-sla, d0, a1				EN 50575

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Simplex cables according DTAG*

specification



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Tight bending radii
- High flexibility
- Halogen-free and non-corrosive fire gases
- Jacket material according to UL 94V-0
- Low fire load for high safety requirements
- Cable constructions according to DTAG* specification

Applications

- Patch cables for data centers
- Installation in indoor area
- Measurement cable withstanding mechanical loading
- Data cable in distribution centres
- Strain-relieved pigtail
- Ideal for applications involving safety requirements in case of fire

Design

Tube	semi-tight tubes 0.9 mm, stripped up to 2 m	
Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

01-.../CHJH-...19	I-H(ZN)H - 1.../125
01-.../CHJH-...24	I-H(ZN)H - 1.../125

Please see page 169.

* DTAG – Deutsche Telekom AG

Specification				
CPR main class		Dca	Dca	
Jacket Ø	mm	1.9	2.4	
Tube Ø	mm	0.9	0.9	
Approx weight	kg/km	3.7	5.3	

Mechanical properties					
Tensile strength	during installation	N	200	400	IEC 60794-1-2 E1
	in service	N	100	200	
Min. bend radius ¹⁾	during installation	mm	50	50	IEC 60794-1-2 E11
	in service	mm	25	25	
Crush resistance	short-term	N/dm	1500	7000	IEC 60794-1-2 E3
	long-term		-	5000	
Impact resistance	Wp = 0.74 J	impacts		10	IEC 60794-1-2 E4
	Wp = 1.5 J		3		

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-25 to +70	-20 to +70	
	in storage	°C	-25 to +70	-40 to +70	

Combustion properties					
Fire load		MJ/m	0.09	0.18	
Fire propagation	on vertical single cable		p	p	IEC 60332-1-2
	on vertical cable bundle			p	IEC 60332-3-25
Smoke density			p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant		
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1		EN 50575

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Duplex figure 8 (zip cord)



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Tight bending radii
- For high thermal stability
- Halogen-free and non-corrosive fire gases
- Jacket material according to UL 94V-0
- Low fire load for high safety requirements

Applications

- Installation in indoor area
- Patch cable in distribution centres
- Data cable in distribution networks
- Ideal for applications involving safety requirements in case of fire

Design

Tube	2 semi-tight tubes 0.9 mm 2 tight tubes 0.6 mm/0.9 mm	
Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

02-.../VJH-...14	I-V(ZN)H - 2 x 1.../125
02-.../FJH-...17	I-V(ZN)H - 2 x 1.../125
02-.../CWJH-...17	I-W(ZN)H - 2 x 1.../125
02-.../CWJH-...20	I-W(ZN)H - 2 x 1.../125
02-.../CWJH-...27	I-W(ZN)H - 2 x 1.../125

Please see page 170, 171.

Specification							
CPR main class				Dca	Dca	Dca	
Jacket Ø	mm	1.4 × 3.0	1.7 × 3.5	1.7 × 3.5	2.0 × 4.1	2.7 × 5.5	
Single-fiber cable Ø	mm	1.4	1.7	1.7	2.0	2.7	
Tube Ø	mm	0.6 tight	0.9 tight	0.9 semi-tight	0.9 semi-tight	0.9 semi-tight	
Channel marking on single-fiber							inscription on one side
Approx weight	kg/km	4.4	6.5	6.6	9.0	14.3	

Mechanical properties								
Tensile strength	during installation	N	300	300	300	800	800	IEC 60794-1-2 E1
	in service	N	2 × 100	2 × 100	2 × 100	2 × 200	2 × 200	
Min. bend radius ¹⁾	during installation	mm	25	50	50	50	50	IEC 60794-1-2 E11
	in service	mm	25	25	25	25	25	
Crush resistance	short-term	N/dm	7500	10 000	10 000	10 000	10 000	IEC 60794-1-2 E3
	long-term	N/dm	2500	4000	4000	5000	5000	
Impact resistance	Wp = 0.74 J Wp = 1.0 J	impacts	10	40	40	20	20	IEC 60794-1-2 E4
Repeated bending	r = 25 mm weight = 0.5 kg	cycles	1000	5000	5000	5000	10 000	IEC 60794-1-2 E6

Thermal properties								
Temperature range	during installation	°C	-10 to +50	-10 to +50	-10 to +50	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-25 to +70	-40 to +70	-25 to +70	-25 to +70	-10 to +70	
	in storage	°C	-40 to +70	-40 to +70	-40 to +70	-40 to +70	-25 to +70	

Combustion properties								
Fire load		MJ/m	0.10	0.13	0.13	0.22	0.34	
Fire propagation	on a vertical single cable				p	p	p	IEC 60332-1-2
	on a vertical cable bundle				p	p	p	IEC 60332-3-25
Halogen acid gas	jacket material		p	p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant					
(EU) No 305/2011 (CPR)					Dca-s1a, d0, a1			EN 50575

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Duplex cables figure 0



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Tight bending radii
- Low fire load for high safety requirements
- Jacket material according to UL 94V-0
- Halogen-free and non-corrosive fire gases

Applications

- Installation in indoor area
- Patch cable in distribution centres
- Data cable in distribution networks
- Ideal for applications involving safety requirements in case of fire

Design

Tube	2 simplex cables with semi-tight tubes 0.9 mm 2 simplex cables with tight tubes 0.6 mm	
Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

02-.../VJH-A...14	I-V(ZN)HH - 2 x 1.../125
02-.../CWJH-A...20	I-W(ZN)HH - 2 x 1.../125
02-.../CWJH-A...27	I-W(ZN)HH - 2 x 1.../125

Please see page 171.

Specification					
CPR main class			Dca	Dca	
Jacket Ø	mm	2.3 × 3.7	3.1 × 5.2	3.5 × 6.2	
single-fiber cable Ø	mm	1.4	2.0	2.7	
Tube Ø	mm	0.6 tight	0.9 semi-tight	0.9 semi-tight	
Channel marking on single cable		numbered	numbered	coloured	
Approx. weight	kg/km	9.4	13.7	24	

Mechanical properties						
Tensile strength	during installation	N	300	800	800	IEC 60794-1-2 E1
	in service	N	2 × 100	2 × 200	2 × 200	
Min. bend radius ¹⁾	during installation	mm	25	50	50	IEC 60794-1-2 E11
	in service	mm	25	25	25	
Crush resistance	short-term	N/dm	9000	7000	10 000	IEC 60794-1-2 E3
	long-term	N/dm	4000	5000	5000	
Impact resistance	Wp = 1.0 J	impacts	50	20	20	IEC 60794-1-2 E4
Repeated bending	r = 25 mm, weight = 0.5 kg	cycles	10 000	10 000	10 000	IEC 60794-1-2 E6

Thermal properties						
Temperature range	during installation	°C	-10 to +50	-10 to +50	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-25 to +70	-10 to +70	-10 to +70	
	in storage	°C	-25 to +70	-25 to +70	-25 to +70	

Combustion properties						
Fire load		MJ/m	0.22	0.33	0.45	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	IEC 60332-3-25
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			
(EU) No 305/2011 (CPR)				Dca-s1a, d0, a1		EN 50575

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

Duplex round cables (LC uniboot compatible)



Properties

- Metal-free indoor cable
- Strain relieve with aramide yarn
- For direct connector assembly
- Tight bending radii
- High flexibility
- Low smoke, halogen free and self-extinguishing
- Jacket material according to UL 94V-0
- LC uniboot compatible

Applications

- Patch cables for data centers
- Duplex cable for LC uniboot

Design

Tube	2 tight buffered tubes 0.6 mm	
Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9 low bend	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green

According to IEC 60794-1-2

Ordering information

02-.../V(ZN)H-...21	I-V(ZN)H - 2 x 1.../125
---------------------	-------------------------

Please see page 171.

Specification			
CPR main class		Dca	
Jacket Ø	mm	2.1	
Tube Ø	mm	0.6 tight	
Approx. weight	kg/km	4.3	

Mechanical properties				
Tensile strength	during installation	N	200	IEC 60794-1-2 E1
	in service	N	100	
Min. bend radius	during installation	mm	10	IEC 60794-1-2 E11
	in service	mm	15	
Crush resistance	short-term	N/dm	5000	IEC 60794-1-2 E3
	long-term	N/dm	900	
Kink resistance	radius 3 mm		p	IEC 60794-1-2 E10

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22-F1
	in service	°C	-25 to +70	
	in storage	°C	-25 to +70	

Combustion properties				
Fire load		MJ/m	0.11	
Fire propagation	on a vertical single cable		p	IEC 60332-1-2
	on a vertical cable bundle		p	IEC 60332-3-25
Halogen acid gas	jacket material		p	IEC 60754-1
Degree of acidity	jacket material		p	IEC 60754-2
2011/65/EC (RoHS)			compliant	
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1	EN 50575

p = passed

Optipack cable with 12 and 24 fibers



Properties

- Metal-free indoor cable
- Strain relief with aramide yarn
- For direct connector assembly with strain relief
- Tight bending radii
- Low smoke, halogen free and self-extinguishing
- Optimised outer-diameter construction
- Ruggedised and non-ruggedised cable construction

Applications

- Data center
- Fits multifiber connectors (as MPO/MTP®)



Design

Strain relief	aramide yarn	
Jacket material	LSFH™	
Tube colour	E9 low bend	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green

According to IEC 60794-1-2

Ordering information

08-.../(ZN)H-...20	I-F(ZN)H - 8.../125
12-.../(ZN)H-...20	I-F(ZN)H - 12.../125
24-.../(ZN)H-...30	I-F(ZN)H - 24.../125
08-.../(ZN)H-...30	I-F(ZN)H - 8.../125
12-.../(ZN)H-...30	I-F(ZN)H - 12.../125
24-.../(ZN)H-...36	I-F(ZN)H - 24.../125

Please see page 172.

Specification						
CPR main class		Dca	Dca	Dca	Dca	
Type		Non-ruggedised		ruggedised		
No. of fibers		8 and 12	24	8 and 12	24	
Jacket Ø	mm	2.0	3.0	3.0	3.6	
Approx weight	kg/km	3.6	8.0	8.3	11.0	

Mechanical properties							
Tensile strength	during installation	N	200	200	500	500	IEC 60794-1-2 E1
	in service	N	100	100	200	200	
Min. bend radius	during installation	mm	20	20	20	20	IEC 60794-1-2 E11
	in service	mm	10	10	10	10	
Crush resistance	during installation	N/dm	1000	1000	5000	5000	IEC 60794-1-2 E3
	in service	N/dm	100	100	1000	1000	
Impact resistance	Wp = 0.5 J	impacts	50	50			IEC 60794-1-2 E4
	Wp = 1.0 J				50	50	
Kink resistance	r = 5 mm		b	b	b	b	IEC 60794-1-2 E10

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-10 to +60	
	in storage	°C	-20 to +70	

Combustion properties							
Fire load		MJ/m	0.07	0.17	0.18	0.24	
Fire propagation	on a vertical single cable on a vertical cable bundle		p p	p p	p p	p p	IEC 60332-1-2 IEC 60332-3-25
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			Dca-sla, d0, a1				EN 50575

p = passed

Optipack DJ* cable up to 24 fibers



Properties

- Metal-free indoor cable
- Strain relieve with aramide yarn
- Robust double jacket construction
- For direct connector assembly
- Tight bending radii
- Low smoke, halogen free and self-extinguishing

Applications

- Data center
- Fits multifiber connectore as (wie MPO*/MTP)
- Installation in indoor areas



Design

Cable design	2 up to 24 fibers Inner jacket LSFH Rip cord	
Jacket material	LSFH™	
Standard colour cable	E9 low bend	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green

According to IEC 60794-1-2

Ordering information

08-.../(ZN)HH-...20	I-F(ZN)HH - 8.../125
12-.../(ZN)HH-...20	I-F(ZN)HH - 12.../125
24-.../(ZN)HH-...30	I-F(ZN)HH - 24.../125

See page 173.

* DJ- Double Jacket

Specification					
CPR main class			B2ca or Cca	B2ca or Cca	
No. of fibers			8 und 12	24	
Jacket Ø inner / outer	mm		2.0/4.0	3.0/4.9	
Approx. weight	kg/km		19	32	

Mechanical properties					
Tensile strength	during installation	N	500	500	IEC 60794-1-2 E1
	in service	N	200	200	
Min. bending radius	during installation	mm	15	15	IEC 60794-1-2 E11
	in service	mm	15	15	
Crush resistance	short-term	N/dm	2000	2000	IEC 60794-1-2 E3
	long-term	N/dm	100	100	
Impact resistance	Wp = 0.5 J	Im-pacts	50	50	IEC 60794-1-2 E4
Kink resistance	r = 10 mm		p	p	IEC 60794-1-2 E10

Thermal properties					
Temperature range	during installation	°C	-10 up to +50		IEC 60794-1-22 F1
	in service	°C	-25 up to +70		
	in storage	°C	-25 up to +70		

Combustion properties					
Fire load		MJ/m	0.6	0.7	
Fire propagation	on a vertical single cable		p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant		
(EU) No 305/2011 (CPR)			B2ca-s1a,d0,a1 or Cca-s1a,d0,a1	B2ca-s1a,d0,a1 or Cca-s1a,d0,a1	EN 50575

p = passed

Breakout cables 1.4 mm



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relieved
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Optimised outer-diameter construction

Applications

- Installation in indoor areas
- Data cable in distribution networks
- For installations in cable ducts
- For horizontal and collapsed backbone cabling
- Terminations possible for SFF connectors only



Design

Cable design	central strength member, non-metallic 12 to 24 single-fiber cables with tight buffered tube 0.6 mm strain relief (aramide yarn) separating tape and 1 ripcord	
Channel marketing	single-fiber cable numbered	
Jacket material	LSFH™	
Tube/jacket colour	E9	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

12-.../VJSNH-...14	I-V(ZN)HH - 12.../125
16-.../VJSNH-...14	I-V(ZN)HH - 16.../125
24-.../VJSNH-...14	I-V(ZN)HH - 24.../125

Please see page 173.

Specification		12	16	24	
CPR main class		Dca	Dca	Cca	
Jacket Ø	mm	9.0	9.0	10.6	
Single-fiber cable Ø	mm	1.4	1.4	1.4	numbered
Tube Ø	mm	0.6	0.6	0.6	
Approx. weight	kg/km	83	76	105	

Mechanical properties						
Tensile strength	during installation	N	3000	4000	5000	IEC 60794-1-2 E1
	in service	N	12 × 70	16 × 70	24 × 70	
Min. bend radius	during installation	mm	130	130	160	IEC 60794-1-2 E11
	in service	mm	90	90	100	
Crush resistance	short-term	N/dm	12 000	12 000	9000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	3000	
Impact resistance	Wp = 2.21 J	impacts	100	100	100	IEC 60794-1-2 E4
Repeated bending	r = 100 mm r = 200 mm	cycles	2000	2000	2000	IEC 60794-1-2 E6

Thermal properties					
Temperature range	during installation	°C	-10 to +60		IEC 60794-1-22 F1
	in service	°C	-25 to +70		
	in storage	°C	-25 to +70		

Combustion properties						
Fire load		MJ/m	2.2	2.3	3.1	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	IEC 60332-3-25
Smoke density			p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant	compliant	compliant	
(EU) No 305/2011 (CPR)			Dca-s2,d2,a1	Dca-s1a,d2,a1	Cca-s1a,d0,a1	EN 50575

p = passed

Breakout cables 2.0 mm



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Cable with improved fire performance

Applications

- Installation in indoor areas
- Data cable in distribution networks
- For installation in cable ducts
- Deal for applications involving high safety requirements in case of fire
- For horizontal and collapsed backbone cabling

Design

Cable design	central strength member, non-metallic 4 to 24 single-fiber cables with semi-tight tubes strain relief (aramide yarn) separating tape and 1 ripcord	
Channel marketing	single-fiber cable numbered	
Jacket material	LSFH™	
Tube/jacket colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

According to IEC 60794-1-2

04-.../CWJSNH-...20	I-W(ZN)HH - 4.../125
08-.../CWJSNH-...20	I-W(ZN)HH - 8.../125
12-.../CWJSNH-...20	I-W(ZN)HH - 12.../125
24-.../CWJSNH-...20	I-W(ZN)HH - 24.../125

Please see page 174.

Approvals

DNV GL Type approved

Certificate No. TAE 000010R

Specification		4	8	12	24	
CPR main class		Dca	Cca	Cca	Cca	
Jacket Ø	mm	7.0	9.0	12.0	14.0	
Single-fiber cable Ø	mm	2.0	2.0	2.0	2.0	numbered
Tube Ø	mm	0.9	0.9	0.9	0.9	
Approx. weight	kg/km	48	77	146	190	

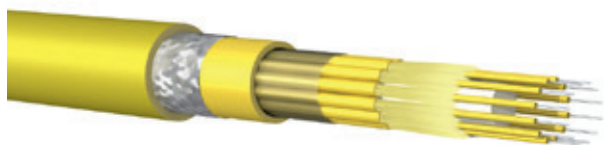
Mechanical properties							
Tensile strength	during installation	N	1200	2400	4000	7200	IEC 60794-1-2 E1
	in service	N	4 × 100	8 × 100	12 × 100	24 × 100	
Min. bend radius	during installation	mm	100	120	180	240	IEC 60794-1-2 E11
	in service	mm	70	80	120	140	
Crush resistance	short-term	N/dm	7500	7500	7500	4000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	2000	2000	
Impact resistance	Wp = 2.21 J, r = 25 mm	impacts	50	50	50	50	IEC 60794-1-2 E4
Torsion	± 360°, l = 1000 mm m = 2 kg	cycles	25 000	25 000	25 000	25 000	IEC 60794-1-2 E7

Thermal properties				
Temperature range	during installation	°C	-10 to +60	IEC 60794-1-22 F12
	in service	°C	-25 to +70	
	in storage	°C	-40 to +70	

Combustion properties							
Fire load		MJ/m	1.09	1.72	3.40	4.1	
Fire propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	p	IEC 60332-3-24
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			Dca-s1a, d0,a1	Cca-s1a,d2,a1		Cca-s1a, d1,a1	EN 50575

p = passed

Fire resistant breakout cables 2.0 mm



Properties

- Metal-free indoor cable
- Each fiber strain relieved
- For direct connector assembly with strain relief
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Cable with improved fire performance

Applications

- Installation in indoor areas
- Data cable in distribution networks
- For installation in cable ducts
- Ideal for applications involving high safety requirements in case of fire
- For horizontal and collapsed backbone cabling



Design

Cable design	central strength member, non-metallic 4 to 12 single-fiber cables with semi-tight tubes strain relief (aramide yarn) separating tape and 1 ripcord	
Channel marketing	single-fiber cable numbered	
Jacket material	LSFH™ – double jacket with flame barrier	
Tube/jacket colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

04-.../CWJSNHIH-...20	I-W(ZN)HIH - 4.../125
08-.../CWJSNHIH-...20	I-W(ZN)HIH - 8.../125
12-.../CWJSNHIH-...20	I-W(ZN)HIH - 12.../125

Please see page 174.

Approvals

DNV GL Type approved
Certificate No TAE 0000192

Specification		4	8	12	
Jacket Ø	mm	10.0	12.0	15.0	
Single-fiber cable Ø	mm	2.0	2.0	2.0	numbered
Tube Ø	mm	0.9	0.9	0.9	
Approx. weight	kg/km	108	147	216	

Mechanical properties						
Tensile strength	during installation	N	1200	2400	4000	IEC 60794-1-2 E1
	in service	N	4 × 100	8 × 100	12 × 100	
Min. bend radius	during installation	mm	145	175	220	IEC 60794-1-2 E11
	in service	mm	95	115	145	
Crush resistance	short-term	N/dm	4000	4000	4000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	2000	
Impact resistance	Wp = 2.21 J, r = 25 mm	impacts	50	50	50	IEC 60794-1-2 E4
Repeated bending	r = 100 mm	cycles	1000	1000	1000	IEC 60794-1-2 E6

Thermal properties				
Temperature range	during installation	°C	-10 to +60	IEC 60794-1-22 F12
	in service	°C	-25 to +70	
	in storage	°C	-40 to +70	

Combustion properties						
Fire load		MJ/m	2.50	3.35	5.00	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	IEC 60332-3-24
Fire test	with circuit integrity (CI)	min.	180	180	180	IEC 60331-25
Fire test	with circuit integrity (CI) with shock	min.	180	180	180	IEC 60331-31
Smoke density			p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			

p = passed

Optipack breakout cables with 16 to 144 fibers



Properties

- Single tubes with 8 or 12 fibers
- Metal-free indoor cable
- Strain relieved with aramide yarn
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Cable with improved fire performance

Applications

- Installation in indoor areas
- Data center in distribution networks
- Ideal for applications involving high safety requirements in case of fire
- For horizontal and collapsed backbone cabling
- Fits multi fiber connectors (MPO/MTP®)



Design

Cable design	central strength member, non-metallic 16 to 144 optical fibers strain relief (aramide yarn) separating tape and 1 ripcord	
Jacket material	LSFH™	
Channel marketing	single-fiber cable numbered	
Tube/jacket colour	E9 low bend	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green

According to IEC 60794-1-2

Ordering information

16-8../(ZN)SNH-...20	I-F(ZN)HH 2 x 8/125	24-12../(ZN)SNH-...20	I-F(ZN)HH 2 x 12/125
32-8../(ZN)SNH-...20	I-F(ZN)HH 4 x 8/125	48-12../(ZN)SNH-...20	I-F(ZN)HH 4 x 12/125
48-8../(ZN)SNH-...20	I-F(ZN)HH 6 x 8/125	72-12../(ZN)SNH-...20	I-F(ZN)HH 6 x 12/125
64-8../(ZN)SNH-...20	I-F(ZN)HH 8 x 8/125	96-12../(ZN)SNH-...20	I-F(ZN)HH 8 x 12/125
96-8../(ZN)SNH-...20	I-F(ZN)HH 12 x 8/125	144-12../(ZN)SNH-...20	I-F(ZN)HH 12 x 12/125

Please see page 175.

Specification						
CPR main class		B2ca or Cca				
	8 fiber	16/32	48	64	96	
	12 fiber	24/48	72	96	144	
Jacket Ø	mm	6.6	7.6	9.2	10.3	
Single cable Ø	mm	2.0	2.0	2.0	2.0	numbered
Approx. Weight	kg/km	46	58	80	97	

Mechanical properties							
Tensile strength	during installation	N	600	800	1000	1400	IEC 60794-1-2 E1
	in service	N	4 x 100	6 x 100	8 x 100	12 x 100	
Min. bend radius	during installation	mm	90	110	130	150	IEC 60794-1-2 E11
	in service	mm	60	70	90	100	
Crush resistance	short-term	N/dm	5000	5000	5000	5000	IEC 60794-1-2 E3
	long-term	N/dm	1000	1000	1000	1000	
Impact resistance	Wp = 1.0 J	impacts	50	50	50	50	IEC 60794-1-2 E4
Kink resistance	r = 20 mm r = 30 mm		p	p	p	p	IEC 60794-1-2 E10

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-10 to +70	
	in storage	°C	-20 to +70	

Combustion properties							
Fire load		MJ/m	0.97	1.2	1.75	2.07	
Fire propagation	on a vertical single cable on a vertical cable bundle		p p	p p	p p	p p	IEC 60332-1-2 IEC 60332-3-25
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			B2ca-s1a,d0,a1 or Cca-s1a,d0,a1				EN 50575

p = passed

Optipack breakout cables with 48 to 288 fibers



Properties

- Single tubes with 24 fibers
- Metal-free indoor cable
- Strain relieved with aramide yarn
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Cable with improved fire performance

Applications

- Installation in indoor areas
- Data cable in distribution networks
- Ideal for applications involving high safety requirements in case of fire
- For horizontal and collapsed backbone cabling
- Fits multi-fiber connectors (MPO/MTP®)



Design

Cable design	central strength member, non-metallic 48 to 288 optical fibers strain relief (aramide yarn) separating tape and 1 ripcord	
Jacket material	LSFH™	
Channel marketing	single-fiber cable numbred	
Tube/jacket colour	E9 Low Bend	yellow
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G50 – OM5	lime green

According to IEC 60794-1-2

Ordering information

96-24.../(ZN)SNH-...30	I-F(ZN)HH 4 x 24/125
144-24.../(ZN)SNH-...30	I-F(ZN)HH 6 x 24/125
288-24.../(ZN)SNH-...30	I-F(ZN)HH 12 x 24/125

Please see page 176.

Specification					
CPR main class		B2ca or Cca			
		96	144	288	
Jacket Ø	mm	9.3	10.8	14.0	
Single cable Ø	mm	3.0	3.0	3.0	numbered
Approx. Weight	kg/km	78	110.5	167	

Mechanical properties						
Tensile strength	during installation	N	600	800	1400	IEC 60794-1-2 E1
	in service	N	4 x 100	6 x 100	12 x 100	
Min. bend radius	during installation	mm	130	160	200	IEC 60794-1-2 E11
	in service	mm	90	110	135	
Crush resistance	short-term	N/dm	5000	5000	5000	IEC 60794-1-2 E3
	long-term	N/dm	1000	1000	1000	
Impact resistance	Wp = 2.21 J	impacts	50	50	50	IEC 60794-1-2 E4
Kink resistance	r = 30 mm		p	p	p	IEC 60794-1-2 E10

Thermal properties					
Temperature range	during installation	°C	-10 to +60		IEC 60794-1-22 F1
	in service	°C	-20 to +70		
	in storage	°C	-40 to +70		

Combustion properties						
Fire load		MJ/m	1.35	2.5	3.1	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	IEC 60332-3-25
Smoke density			p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			
(EU) No 305/2011 (CPR)			B2ca-s1a,d0,a1 oder Cca-s1a,d0,a1			EN 50575

p = passed

Riser cables (distribution cables)



Properties

- Metal-free indoor cable
- Strain relief with aramide yarn
- For direct connector assembly
- Ripcord for easy jacket removal
- For high mechanical and thermal stability
- Low smoke, halogen-free and self-extinguishing

Applications

- Internal building distribution
- Rising zone/LAN
- Applications with high safety requirements
- For horizontal and collapsed backbone cabling



Design

Cable design	central strength member, non-metallic 4 to 24 tight tube fibers strain relief (aramide yarn) 1 ripcord
Tube colour	according to colour code
Jacket material	LSFH™
Outer jacket colour	black

According to IEC 60794-1-2

Ordering information

04-.../FSN(ZN)H-...50	I-V(ZN)H - 4.../125
12-.../FSN(ZN)H-...70	I-V(ZN)H - 12.../125
24-.../FSN(ZN)H-...88	I-V(ZN)H - 24.../125

Please see page 176.

Specification		4 Fasern	12 Fasern	24 Fasern	
CPR main class			Dca		
Jacket Ø	mm	5.0	7.0	8.8	
Tube Ø	mm	0.9	0.9	0.9	coloured
Approx. weight	kg/km	28	52	77	

Mechanical properties						
Tensile strength	during installation	N	1200	3000	4500	IEC 60794-1-2 E1
	in service	N	400	1000	1500	
Min. bend radius ¹⁾	during installation	mm	100	130	130	IEC 60794-1-2 E11
	in service	mm	50	70	100	
Crush resistance	short-term	N/dm	18 000	18 000	15 000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	2000	
Impact resistance	Wp = 2.21 J	impacts	100	100	100	IEC 60794-1-2 E4
Repeated bending	r = 50 mm	cycles	1000	2000	2000	IEC 60794-1-2 E6

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-20 to +70	
	in storage	°C	-25 to +70	

Combustion properties					
Fire load		MJ/m	0.4	1.1	1.9
Fire propagation	on a vertical single cable		p	p	p
	on a vertical cable bundle		p	p	p
Smoke density			p	p	p
Halogen acid gas	jacket material		p	p	p
Degree of acidity	jacket material		p	p	p
2011/65/EC (RoHS)			compliant		
(EU) No 305/2011 (CPR)				Dca-s2, d0, a1	EN 50575

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

FTTH simplex indoor cables



Properties

- Metal-free indoor cable
- Strain relief with aramide yarn
- Tube can be stripped up to 1 m in one piece
- For direct connector assembly
- Tight bending radii
- Low smoke, halogen-free and non-corrosive
- Jacket material according to UL94V-0



Applications

- Data cable in distribution network – FTTH
- Installation in indoor areas
- For horizontal and collapsed backbone cabling

Design

Cable design	1 semi-tight tube
Strain relief	aramide yarn
Jacket material	LSFH™
Jacket colour	white/grey

According to IEC 60794-1-2

Ordering information

01-E9A2/CWJH-...27-FG	I-V(ZN)H - 1.../125
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Please see page 177.

Specification			
CPR main class		Dca	
Jacket Ø	mm	2.7	
Tube Ø	mm	0.9	
Approx. weight	kg/km	7.0	

Mechanical properties				
Tensile strength	during installation	N	400	IEC 60794-1-2 E1
	in service	N	200	
Min. bend radius 1)	during installation	mm	50	IEC 60794-1-2 E11
	in service	mm	25	
Crush resistance	short-term	N/dm	7000	IEC 60794-1-2 E3
	long-term	N/dm	5000	
Impact resistance	Wp = 1.0 J	impacts	20	IEC 60794-1-2 E4
Repeated bending	r = 25 mm	cycles	5000	IEC 60794-1-2 E6

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-25 to +70	
	in storage	°C	-25 to +70	

Combustion properties			
Fire load		MJ/m	0.17
Fire propagation	on a vertical single cable		p
	on a vertical cable bundle		p
Halogen acid gas	jacket material		p
Degree of acidity	jacket material		p
2011/65/EC (RoHS)			compliant
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimised.

FTTH microtube



Properties

- Metal-free indoor cable
- Strain relieved with aramide yarn
- Ripcord for easy jacket removal
- No need for cleaning the fibers (jelly free)
- Tight bending radii
- Halogen-free and non-corrosive fire gases
- Jacket material according to UL 94V-0
- Easy stripping

Applications

- Data cable in distribution network – FTTH
- Installation in indoor areas
- For horizontal and collapsed backbone cabling

Design

Cable design	microtube dry with 4 fibers
Strain relief	aramide yarn
Jacket material	LSFH™
Jacket colour	white/grey/yellow

According to IEC 60794-1-2

Ordering information

04-E9A2/MH(ZN)H-...23	I-B(ZN)H - 4.../125
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Please see page 177.

Specification			
CPR main class		Dca	
Number of fibers		4	
Jacket Ø	mm	2.3	
Approx. weight	kg/km	5.2	

Mechanical properties				
Tensile strength	during installation	N	400	IEC 60794-1-2 E1
	in service	N	200	
Min. bend radius	during installation	mm	10	IEC 60794-1-2 E11
	in service	mm	10	
Crush resistance	short-term	N/dm	1000	IEC 60794-1-2 E3
	long-term	N/dm	500	
Impact resistance	Wp = 1 J	impacts	3	IEC 60794-1-2 E4
Kink resistance	r = 5 mm		p	IEC 60794-1-2 E10

Thermal properties				
Temperature range	during installation	°C	-5 to +50	IEC 60794-1-22 F1
	in service	°C	-10 to +60	
	in storage	°C	-20 to +70	

Combustion properties				
Fire load		MJ/m	0.09	
Fire propagation	on a vertical single cable		p	IEC 60332-1-2
	on a vertical cable bundle		p	IEC 60332-3-25
Smoke density			p	IEC 61034-2
Halogen acid gas	jacket material		p	IEC 60754-1
Degree of acidity	jacket material		p	IEC 60754-2
2011/65/EC (RoHS)			compliant	
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1	EN 50575

p = passed

FTTH indoor cables with tight tubes 0.6 mm



Properties

- Metal-free indoor and outdoor cable
- Strain relieved with aramide yarn
- For direct connector assembly
- Tight bending radii
- Halogen-free and non-corrosive fire gases
- Optimised outer-diameter construction

Applications

- Data cable in distribution network – FTTH
- Installation in indoor areas
- For horizontal and collapsed backbone cabling



Design

Cable design	4 tight tubes buffered 0.6 mm, easy stripping
Strain relief	aramide yarn
Jacket material	LSFH™
Jacket colour	grey

According to IEC 60794-1-2

Ordering information

04-E9A2/V(ZN)H-...28	I-V(ZN)H - n x n .../125
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Please see page 177.

Specification			
CPR main class		Dca	
Number of fibers	mm	4	
Jacket Ø		2.8	
Tube Ø	mm	0.6	coloured
Approx. weight	kg/km	8	

Mechanical properties				
Tensile strength	during installation	N	400	IEC 60794-1-2 E1
	in service	N	200	
Min. bend radius	during installation	mm	7.5	IEC 60794-1-2 E11
	in service	mm	7.5	
Crush resistance	short-term	N/dm	2000	IEC 60794-1-2 E3
	long-term	N/dm	1000	
Impact resistance	Wp = 1 J	impacts	5	IEC 60794-1-2 E4
Repeated bending	r = 30 mm	cycles	5000	IEC 60794-1-2 E6
Kink resistance	r = 6 mm	cycles	p	IEC 60794-1-2 E10
Coiling capability	length = 100 m/r = 70 mm	cycles	3	HUBER+SUHNER

Thermal properties				
Temperature range	during installation	°C	-20 to +70	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	in storage	°C	-40 to +70	

Combustion properties			
Fire load		MJ/m	0.19
Fire propagation	on a vertical single cable		p
Smoke density			p
Halogen acid gas	jacket material		p
Degree of acidity	jacket material		p
2011/65/EC (RoHS)			compliant
(EU) No 305/2011 (CPR)		Dca-sla, d0, a1	EN 50575

p = passed

FTTH indoor cables HOMESTAR



Properties

- Metal-free indoor and outdoor cable
- Strain relieved with aramide yarn
- For direct connector assembly
- Tight bending radii
- Low smoke, halogen-free and self-extinguishing

Applications

- Data cable in distribution network – FTTH
- Installation in indoor areas
- For horizontal and collapsed backbone cabling

Design

Cable design	central strength member, non-metallic 1, 2 to 4 tight buffered tubes
Strain relief	aramide yarn
Jacket material	LSFH™
Jacket colour	grey

Gemäss IEC 60794-1-2

Ordering information

01-E9A./F(ZN)H-...48	I-V(ZN)H - n .../125
02-E9A./FSN(ZN)H-...48	I-V(ZN)H - n .../125
04-E9A./FSN(ZN)H-...48	I-V(ZN)H - n .../125

Please see page 177.

Specification					
Number of fibers		1	2	4	
Jacket Ø	mm	4.8	4.8	4.8	
Tube Ø	mm	0.9	0.9	0.9	coloured
Approx. weight	kg/km	25	25	25	

Mechanical properties						
Tensile strength	during installation	N	400	500	500	IEC 60794-1-2 E1
	in service	N	200	300	300	
Min. bend radius	during installation	mm	10	10	10	IEC 60794-1-2 E11
	in service	mm	10	10	10	
Crush resistance	short-term	N/dm	20 000	15 000	10 000	IEC 60794-1-2 E3
	long-term	N/dm	1500	1500	1500	
Impact resistance	Wp = 2.21 J	impacts	100	100	100	IEC 60794-1-2 E4
Repeated bending	r = 30 mm	cycles	5000	5000	5000	IEC 60794-1-2 E6
Kink resistance	r = 7.5 mm		p	p	p	IEC 60794-1-2 E10
Torsion	angle = $\pm 360^\circ$ length = 500 mm	cycles	1000	1000	1000	IEC 60794-1-2 E7
H+S crush resistance	short-term	N/5 mm	400	500	500	HUBER+SUHNER
	long-term	N/5 mm	200	300	300	

Thermal properties					
Temperature range	during installation	°C	-10 to +50		IEC 60794-1-22 F1
	in service	°C	-25 to +70		
	in storage	°C	-25 to +70		

Combustion properties						
Fire load		MJ/m	0.6	0.6	0.6	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
Smoke density			p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			

p = passed

Universal cables

	Cable type	Page	Ordering key	Weight kg/km	Amount of fibers
	Optipack universal cable up to 144 fibers	86	24-12-.../(ZN)SN(ZNG)H-...20 48-12-.../(ZN)SN(ZNG)H-...20 72-12-.../(ZN)SN(ZNG)H-...20 96-12-.../(ZN)SN(ZNG)H-...20 144-12-.../(ZN)SN(ZNG)-...20	117 117 135 144 160	up to 24 up to 48 up to 72 up to 96 up to 144
	Jelly-free – dry block multifiber loose tube up to 24 fibers	88	12-.../BQ(ZN)H-...35 24-.../Q(ZN)H-...50	11.4 25	up to 12 up to 24
	Jelly-free – dry block glass-armoured multi- fiber loose tube up to 24 fibers	90 92	24-.../Q(ZNG)H-...70#D 24-.../Q(ZNG)H-...70#C 24-.../Q(ZNG)H-...85 24-.../Q(ZNG)H-...120	50 57 83 178	up to 24 up to 24 up to 24 up to 24
	Jelly-free – dry block glass-armoured multi-fiber loose tube twintube up to 24 fibers	94	48-.../Q(ZNG)H-...94 24-.../BQ(ZNG)H-...88	101	up to 48
	Jelly-free – dry block glass-armoured multi- fiber loose tube up to 144 fibers	96	24-.../BQSN(ZNG)H-...100 48-.../BQSN(ZNG)H-...100 72-.../BQSN(ZNG)H-...110 96-.../BQSN(ZNG)H-...126 144-.../BQSN(ZNG)H-...150	100 100 120 148 217	up to 24 up to 48 up to 72 up to 96 up to 144
	Jelly-free – dry block glass-armoured multi- fiber loose tube up to 144 fibers	98	24-.../BQSN(ZNG)H-...96 48-.../BQSN(ZNG)H-...96 72-.../BQSN(ZNG)H-...106 96-.../BQSN(ZNG)H-...122 144-.../BQSN(ZNG)H-...145	100 100 120 148 217	up to 24 up to 48 up to 72 up to 96 up to 144
	Non-armoured multi- fiber loose tube up to 24 fibers	100	12-.../BW(ZN)H-...35 24-.../W(ZNG)H-...50	10.3 27	up to 12 up to 24
	Glass-armoured multi- fiber loose tube up to 24 fibers	102	24-.../W(ZNG)H-...70 24-.../W(ZNG)H-...85 24-.../W(ZNG)H-...120	55 83 178	up to 24 up to 24 up to 24
	Glass-armoured multi-fiber loose tube twintube up to 24 fibers	104	24-.../W(ZNG)H-...94	101	up to 24

p = passed

Multifiber loose tube	Jacket Ø mm	Jacket material	Rodent protection	Tensile strength N	Crush resistance N/dm	Temperature range (in service) °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
	8.8 8.8 9.7 10.8 12.0	LSFH LSFH LSFH LSFH LSFH	p p p p p	9000 9000 9000 9000 9000	3000 3000 3000 3000 3000	-40 to +70 -40 to +70 -40 to +70 -40 to +70 -40 to +70	p p p p p		On request On request On request On request On request
mini standard	3.5 5.0	LSFH™ LSFH™		900 1000	3000 3000	-25 to +70 -5 to +70			
standard standard standard standard	7.0 7.0 8.5 12.0	LSFH LSFH LSFH LSFH	p p p p	2000 2000 3000 9000	5000 5000 8000 11000	-40 to +70 -40 to +70 -40 to +70 -40 to +70	p p p p	p p p p	Dca-s1a, d2, a1 Cca-s1a, d0, a1 Dca-s1a, d0, a1 B2ca-s1a, d0, a1
standard	8.8 x 9.4	LSFH	p	3000	8000	-20 to +70	p	p	Dca-s1a, d0, a1
mini mini mini mini mini	10 10 11 12.6 15	LSFH LSFH LSFH LSFH LSFH	p p p p p	9000 9000 9000 9000 9000	6000 6000 6000 6000 6000	-40 to +70 -40 to +70 -40 to +70 -40 to +70 -40 to +70	p p p p p		Cca-s1a, d0, a1 Cca-s1a, d0, a1 Cca-s1a, d0, a1 Cca-s1a, d0, a1 Cca-s1b,d0,a1
mini mini mini mini mini	9.6 9.6 10.6 12.2 14.5	LSFH™ LSFH™ LSFH™ LSFH™ LSFH™	p p p	9000 9000 9000 9000 9000	6000 6000 6000 6000 6000	-40 to +70 -40 to +70 -40 to +70 -40 to +70 -40 to +70	p p p p p	p p p p p	Dca-s1a, d0, a1 Dca-s1a, d0, a1 Dca-s2, d0, a1 Dca-s2, d0, a1 Eca
mini standard	3.5 5.0	LSFH™ LSFH™	p	900 1000	3000 3000	-40 to +70 -40 to +70			
standard standard standard	7.0 8.5 12.0	LSFH™ LSFH™ LSFH™	p p p	2000 3000 9000	5000 8000 11000	-40 to +70 -40 to +70 -40 to +70	p p p	p p p	Dca-s2, d1, a1 Dca-s1a, d0, a1
standard	8.8 x 9.4	LSFH™	p	3000	8000	-20 to +70	p	p	Dca-s2, d2, a1

Universal cables

	Cable type	Page	Ordering key	Weight kg/km	Amount of fibers
	Glass-armoured multi-fiber loose tube up to 144 fibers	106	24-.../BWSN(ZNG)H-...96 48-.../BWSN(ZNG)H-...96 72-.../BWSN(ZNG)H-...106 96-.../BWSN(ZNG)H-...122 144-.../BWSN(ZNG)H-...145	109 109 119 151 220	up to 24 up to 48 up to 72 up to 96 up to 144
	Steel-armoured multi-fiber loose tube up to 24 fibers	108	24-.../W(ZN)HAH-...80	82	up to 24
	Steel-armoured multi-fiber loose tube up to 72 fibers	108	24-.../W(ZNG)HAH-...125	200	up to 24
	Steel-armoured multi-fiber loose tube up to 72 fibers	110	48-.../BWSN(ZNG)HAH-...130 72-.../BWSN(ZNG)HAH-...140	220 246	up to 48 up to 72

p = passed

Multifiber loose tube	Jacket Ø mm	Jacket material	Rodent protection	Tensile strength N	Crush resistance N/dm	Temperature range (in service) °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
mini	9.6	LSFH™	p	9000	6000	-40 to +70	p	p	Dca-sla, d0, a1 Dca-sla, d0, a1
mini	9.6	LSFH™	p	9000	6000	-40 to +70	p	p	
mini	10.6	LSFH™	p	9000	6000	-40 to +70	p	p	
mini	12.2	LSFH™	p	9000	6000	-40 to +70	p	p	
mini	14.5	LSFH™	p	9000	6000	-40 to +70	p	p	
standard	8.0	LSFH™	p	3000	4000	-40 to +70	p	p	
standard	12.5	LSFH™	p	3000	8000	-20 to +70	p	p	
mini	13.0	LSFH™	p	9000	8000	-40 to +70	p	p	
mini	14.0	LSFH™	p	9000	8000	-40 to +70	p	p	

Optipack universal cable 16 up to 144 fibers



Properties

- Single cables with 12 fibers
- Metal-free indoor cable
- Strain relieved with aramide yarn
- Rip cord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Cable with improved fire performance

Applications

- Data cable in distribution networks
- Ideal for applications involving high safety requirements in case of fire
- For horizontal and collapsed backbone cabling
- Fits multifiber connectors (MPO®/MTP)

Design

Cable design	central strength member, non-metallic 48 to 288 optical fibers strain relief (aramide yarn) separating tapen and 1 ripcord
Strain relief and rodent protection	glass roving
Jacket material	LSFH™
Standard colour cable jacket	colour coded

According to IEC 60794-1-2

Ordering information

16-8.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 2 x 8/125	24-12.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 2 x 12/125
32-8.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 4 x 8/125	48-12.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 4 x 12/125
48-8.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 6 x 8/125	72-12.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 6 x 12/125
64-8.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 8 x 8/125	96-12.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 8 x 12/125
96-8.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 12 x 8/125	144-12.../(ZN)SN(ZNG)H-...20	U-F(ZN)HBH 12 x 12/125

Specification						
CPR main class		On request				
No. of fibers	mm	24/48	72	96	144	
Cable jacket Ø	mm	8.8	9.7	10.8	12.0	
Single cable Ø	mm	2.0	2.0	2.0	2.0	numbered
Approx. weight	kg/km	117	135	144	160	

Mechanical properties							
Tensile strength	during installation	N	9000	9000	9000	9000	IEC 60794-1-2 E1
	in service	N	4 x 100	6 x 100	8 x 100	12 x 100	
Min. bending radius ¹⁾	during installation	mm	130	150	160	180	IEC 60794-1-2 E11
	in service	mm	90	100	110	150	
Crush resistance	short-term	N/dm	3000	3000	3000	3000	IEC 60794-1-2 E3
	long-term	N/dm	1500	1500	1500	1500	
Impact resistance	Wp = 2.21 J	Impacts	50	50	50	50	IEC 60794-1-2 E4

Thermal properties					
Temperature range	during installation	°C	-10 to +50		IEC 60794-1-22 F12
	in service	°C	-40 to +70		
	in storage	°C	-40 to +70		

Combustion properties							
Fire load		MJ/m	1.4	1.45	1.6	1.8	
Fire propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			classes on request				EN 50575

p = passed

Jellyfree multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free
- Strain relief with aramide yarn
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Low fire load for high safety requirements
- No need for cleaning the fibers

Applications

- Data cable in distribution networks
- For vertical applications up to 500 m
- For installation in cable ducts

Design

Cable design	dry multifiber loose tube with 2 up to 24 fibers 1 ripcord	
Strain relief	aramide yarn	
Fiber colour	according to colour code	
Jacket material	LSFH™	
Jacket colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G 50 – OM4	heather violet
	G50 – OM5	lime green
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

12-.../BQ(ZN)H-...35	I-BQ(ZN)H - 1 x n/125
24-.../Q(ZN)H-...50	I-BQ(ZN)H - 1 x n/125

Please see page 178.

Specification				
Jacket Ø	mm	3.5	5.0	
Number of fibers		2 to 12	2 to 24	
Multifiber loose tube	mm	mini	standard	
Approx. weight	kg/km	11.4	25.0	

Mechanical properties					
Tensile strength	during installation	N	900	1000	IEC 60794-1-2 E1
	in service	N	250	400	
Min. bend radius	during installation	mm	50	80	IEC 60794-1-2 E11
	in service	mm	35	50	
Crush resistance	short-term	N/dm	3000	3000	IEC 60794-1-2 E3
	long-term	N/dm	1500	1500	

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-25 to +70	-5 to +70	
	in storage	°C	-25 to +70	-25 to +70	

Combustion properties					
Fire load		MJ/m	0.24	0.63	
Smoke density				p	IEC 61034-2
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
2002/95/EC (RoHS)			compliant		

p = passed

Jelly-free glass-armoured multifiber loose tube cable – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free, no need for cleaning the fibers
- Rodent-protected, glass-armoured
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- Data cable in distribution networks
- For vertical applications up to 500 m
- For installation in cable ducts
- For high safety requirements in case of fire



Design

Cable design	dry multifiber loose tube with up to 24 fibers
Strain relief and rodent protection	glass-roving
Fiber colour	according to colour code
Jacket material	LSFH™
Jacket colour	colour coded

According to IEC 60794-1-2

Ordering information

24-.../Q(ZNG)H-...70 *	U-DQ(ZN)BH 1 x n/125
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See page 179, 180.

Approvals

* UL approval acc. to OFNR/OFNG/OFN (only with CPR-class Dca-s1a,d0,a1)

Specification				
CPR main class		Cca	Dca	
Cable jacket Ø	mm	7.0		
No. of fibers		2 to 24		
Approx. weight	kg/km	57	55	

Mechanical properties					
Tensile strength	during installation	N	2000		IEC 60794-1-2 E1
	in service	N	1200		
Min. bending radius	during installation	mm	110		IEC 60794-1-2 E11
	in service	mm	70		
Crush resistance	short-term	N/dm	5000		IEC 60794-1-2 E3
	long-term	N/dm	2000		
Impact resistance	Wp = 1 J	Impacts	100		IEC 60794-1-21 E4
Torsion	± 180 °	Cycles	20000		IEC 60794-1-21 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	IEC 60794-1-2 F5B

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	in storage	°C	-40 to +70	

Combustion properties					
Fire load		MJ/m	0.7	1.0	
Fire propagation	on a vertical single cable		p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	p	IEC 60332-3-25
Smoke density			p	p	IEC 61034-2
2011/65/EC (RoHS)			compliant		
(EU) No 305/2011 (CPR)			Cca-s1a,d0,a1	Dca-s1a,d0,a1	EN 50575

p = passed

Jelly-free glass-armoured multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free, no need for cleaning the fibers
- Rodent-protected, glass-armoured
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- Data cable in distribution networks
- For vertical applications up to 500 m
- For installation in cable ducts
- For high safety requirements in case of fire



Design

Cable design	dry multifiber loose tube with up to 24 fibers
Strain relief and rodent protection	glass-roving
Fiber colour	according to colour code
Jacket material	LSFH™
Jacket colour	colour coded

According to IEC 60794-1-2

Ordering information

24-.../Q(ZNG)H-...85	U-BQ(ZN)BH 1 x n/125
24-.../Q(ZNG)H-...120	U-BQ(ZN)BH 1 x n/125

Please see page 180.

Approvals

* UL listed acc. OFNR/OFNG/OFN (only with CPR class Dca-s1a, d2, a1)

Specification					
CPR main class		Dca	B2ca		
Jacket Ø	mm	8.5	12.0		
Number of fibers		2 to 24	2 to 24		
Approx. weight	kg/km	83	178		

Mechanical properties					
Tensile strength	during installation	N	3000	9000	IEC 60794-1-2 E1
	in service	N	1500	4500	
Min. bend radius	during installation	mm	130	180	IEC 60794-1-2 E11
	in service	mm	80	120	
Crush resistance	short-term	N/dm	8000	11000	IEC 60794-1-2 E3
	long-term	N/dm	300	6000	
Impact resistance	Wp = 1 J Wp = 4.4 J Wp = 4.5 J	impacts	30	500	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	IEC 60794-1-2 F5B

Thermal properties					
Temperature range	during installation	°C	-10 to +50		IEC 60794-1-22 F1
	in service	°C	-40 to +70		
	in storage	°C	-40 to +70		

Combustion properties					
Fire load		MJ/m	1.5	3.1	
Fire propagation	on a vertical single cable		p	p	IEC 60332-1-2
Fire propagation	on vertical cable bundle		p	p	IEC 60332-3-25
Smoke density			p	p	IEC 61034-2
2011/65/EC (RoHS)					
(EU) No 305/2011 (CPR)			Dca-s1a,d0,a1	B2ca-s1a,d0,a1	EN 50575

p = passed

Jelly-free loose tube cables with glass-armouring TWINTUBE – up to 48 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free, no need for cleaning the fiber
- Rodent-protected, glass-armoured
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- For installations directly in the ground and in mechanically unprotected environments
- As data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes
- Ideal for applications involving high safety requirements in case of a fire

Design

Cable design	2 multifiber loose tubes, jelly-filled with 2 x 12 fibers 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	LSFH™
Jacket colour	colour coded

According to IEC 60794-1-2

Ordering information

48-.../Q(ZNG)H-...94	U-BQ(ZN)BH 2 x n/125
24-.../BQ(ZNG)H-...88	U-BQ(ZN)BH 2 x n/125

Please see page 180.

Specification				
CPR main class		Dca	Cca	
Jacket Ø	mm	8.8 × 9.4	8.8	
Number of fibers		2 × 24	2 × 12	
Approx. weight	kg/km	101	92	

Mechanical properties						
Tensile strength	during installation	N	3000			IEC 60794-1-2 E1
	in service	N	1500			
Min. Min. bend radius	during installation	mm	150 ¹⁾	135	IEC 60794-1-2 E11	
	in service	mm	100 ¹⁾	90		
Crush resistance	short-term	N/dm	8000 ¹⁾			IEC 60794-1-2 E3
	long-term	N/dm	4000 ¹⁾			
Water penetration	h = 1 m, 24 h, p < 3 m		p			IEC 60794-1-2 F5B

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-20 to +70	
	in storage	°C	-40 to +70	

Combustion properties					
Fire load		MJ/m	1.85	1.1	
Fire propagation	on a vertical single cable		p		IEC 60332-1-2
Halogen acid gas	jacket material		p		IEC 60754-1
Degree of acidity	jacket material		p		IEC 60754-2
2011/65/EC (RoHS)			compliant		
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1	Cca-s1a,d0,a1	EN 50575

p = passed

¹⁾ refers to the flat side of the cable

Jelly-free loose tube cable with CPR-Cca classification up to 144 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free, no need for cleaning the fiber
- Rodent protection, glass-armoured
- Ripcord for easy jacket removal
- Jacket material according to UL 94V-0
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- Data cable in distribution networks
- For applications involving high safety requirements in case of fire.

Design

Cable design	4 to 12 multifiber loose tube, jelly-free with 2 to 12 fibers strength member 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	LSFH™
Jacket colour	colour coded

According to IEC 60794-1-2

Ordering information

24-.../BQSN(ZNG)H-...100	U-DQ(ZN)BH 12 x n/125
48-.../BQSN(ZNG)H-...100	U-DQ(ZN)BH 12 x n/125
72-.../BQSN(ZNG)H-...110	U-DQ(ZN)BH 12 x n/125
96-.../BQSN(ZNG)H-...126	U-DQ(ZN)BH 12 x n/125
144-.../BQSN(ZNG)H-...150	U-DQ(ZN)BH 12 x n/125

See page 181.

Specification		4	6	8	12	
CPR main class		Cca				
No. of fibers		24/48	72	96	144	
Jacket-Ø	mm	10.0	11.0	12.6	15.0	
Loose tube		Mini	Mini	Mini	Mini	
Approx. weight	kg/km	113	135	169	242	

Mechanical properties							
Tensile strength	during installation	N	9000	9000	9000	9000	IEC 60794-1-2 E1
	in service	N	4000	4000	4000	4000	
Min bending radius	during installation	mm	140	160	180	220	IEC 60794-1-2 E11
	in service	mm	100	110	120	150	
Crush resistance	short-term	N/dm	6000	6000	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	3000	3000	
Impact resistance	Wp = 2.21 J	impacts	50	50	50	50	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	p	p	IEC 60794-1-2 F5A

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	in storage	°C	-40 to +70	

Combustion properties							
Fire load		MJ/m	1.5	1.8	2.5	3.6	
Flame propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			Cca-s1a,d0,a1			Cca-s1b,d0,a1	EN 50575

p = passed

Jelly-free glass-armoured multifiber loose tube cables – up to 144 fibers



Properties

- Metal-free indoor and outdoor cable
- Jelly-free, no need for cleaning the fiber
- Rodent protection, glass-armoured
- Ripcord for easy jacket removal
- Jacket material according to UL 94V-0
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- Data cable in distribution networks
- For applications involving high safety requirements in case of fire

Design

Cable design	4 to 12 multifiber loose tube, jelly-free with 2 to 12 fibers strength member 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	LSFH™
Jacket colour	colour coded

According to IEC 60794-1-2

Ordering information

24-.../BQSN(ZNG)H-...96	U-BQ(ZN)BH 2 x n/125
48-.../BQSN(ZNG)H-...96	U-BQ(ZN)BH 4 x n/125
72-.../BQSN(ZNG)H-...106	U-BQ(ZN)BH 6 x n/125
96-.../BQSN(ZNG)H-...122	U-BQ(ZN)BH 8 x n/125
144-.../BQSN(ZNG)H-...145	U-BQ(ZN)BH 12 x n/125

Please see page 182.

Specification		4	6	8	12	
CPR main class		Dca			Eca	
Number of fibers		24/48	72	96	144	
Jacket Ø	mm	9.6	10.6	12.2	14.5	
Number of fibers		Mini	Mini	Mini	Mini	
Approx. weight	kg/km	109	119	151	220	

Mechanical properties							
Tensile strength	during installation	N	9000	9000	9000	9000	IEC 60794-1-2 E1
	in in service	N	4000	4000	4000	4000	
Min. bend radius	during installation	mm	140	160	180	220	IEC 60794-1-2 E11
	in service	mm	100	110	120	150	
Crush resistance	short-term	N/dm	6000	6000	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	3000	3000	
Impact resistance	Wp = 2.21 J	impact	50	50	50	50	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	p	p	IEC 60794-1-2 F5A

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	in storage	°C	-40 to +70	

Combustion properties							
Fire load		MJ/m	1.9	2.3	3.0	4.3	
Fire propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
Fire propagation	on vertical cable bundle		p	p	p	p	IEC 60332-3-25
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			Dca-s1a,d0,a1	Dca-s2,d0,a1		Eca	EN 50575

p = passed

Non-armoured multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Strain relief with aramide yarn
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- For use in ducts and in unprotected environment

Applications

- Data cable in distribution networks
- Installation in indoor and outdoor areas
- For installation in cable ducts

Design

Cable design	multifiber loose tube with 2 up to 24 fibers, jelly-filled 1 ripcord
Strain relief	aramide yarn
Fiber colour	according to colour code
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

12-.../BW(ZN)H-...35	U-D(ZN)H 1 x n/125
24-.../W(ZN)H-...50	U-D(ZN)H 1 x n/125

Please see page 182, 183.

Specification					
Jacket Ø	mm	3.5	5.0		
Number of fibers		2 to 12	2 to 24		
Multifiber loose tube		mini	standard		
Approx. weight	kg/km	10	27		

Mechanical properties					
Tensile strength	during installation	N	900	1000	IEC 60794-1-2 E1
	in service	N	250	400	
Min. bend radius	during installation	mm	52.5	80	IEC 60794-1-2 E11
	in service	mm	35	50	
Crush resistance	short-term	N/dm	3000	3000	IEC 60794-1-2 E3
	long-term	N/dm	1000	1500	
Impact resistance	Wp = 1.4 J Wp = 2.21 J	impacts	50	50	IEC 60794-1-2 E4
Repeated bending	r = 35 mm/1 kg r = 50 mm/1 kg	cycles	5000	5000	IEC 60794-1-2 E6

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-40 to +70	
	in storage	°C	-40 to +70	-40 to +70	

Combustion properties					
Fire load		MJ/m	0.43	0.71	
Smoke density				p	IEC 61034-2
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant		

p = passed

Glass-armoured multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Rodent protection, glass-armoured
- For high mechanical requirements
- Low smoke, halogen-free and self-extinguishing
- Low fire load for high safety requirements
- Longitudinal and transversal watertight cable

Applications

- For installation directly in the ground and in mechanically unprotected environments
- Data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes
- Ideal for high safety requirements in case of a fire.

Design

Cable design	multifiber loose tube up to 24 fibers, jelly-filled
Strain relief and rodent protection	glass-roving
Fiber colour	according to colour code
Jacket material	LSFH™
Jacket colour	black

Gemäss IEC 60794-1-2

Ordering information

24-.../W(ZNG)H-...70	U-DQ(ZN)BH 1 x n/125
24-.../W(ZNG)H-...85 *	U-DQ(ZN)BH 1 x n/125
24-.../W(ZNG)H-...120	U-DQ(ZN)BH 1 x n/125

Please see page 183, 184, 185.

Approvals

* UL listed acc. OFN/OFNG

Specification					
CPR main class		Dca	Dca		
Jacket Ø	mm	7.0	8.5	12.0	
Number of fibers		2 to 24	2 to 24	2 to 24	
Multifiber loose tube		standard	standard	standard	
Approx. weight	kg/km	55	83	178	

Mechanical properties						
Tensile strength	during installation	N	2000	3000	9000	IEC 60794-1-2 E1
	in service	N	1200	1500	4500	
Min. bend radius	during installation	mm	110	130	180	IEC 60794-1-2 E11
	in service	mm	70	80	120	
Crush resistance	short-term	N/dm	5000	8000	11 000	IEC 60794-1-2 E3
	long-term	N/dm	2000	3000	6000	
Impact resistance	Wp = 1.5 J Wp = 4.41 J Wp = 4.5 J	impacts	100	30	500	IEC 60794-1-2 E4
Repeated bending	r = 50 mm/2.5 kg	cycles	2000	5000	5000	IEC 60794-1-2 E6
Torsion	± 1440°, 1 length 1 m	cycles	50	50	5	IEC 60794-1-2 E7
Water penetration	h = 1 m, 48 h, p < 3 m		p	p	p	IEC 60794-1-2 F5B

Thermal properties						
Temperature range	during installation	°C	-10 to +50	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-40 to +70	-40 to +70	
	in storage	°C	-40 to +70	-40 to +70	-40 to +70	

Combustion properties						
Fire load		MJ/m	1.2	1.5	3.1	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	p	p	IEC 60332-3-24
Fire test	with circuit integrity (CI)	min.	180	180	180	IEC 60331-25
Smoke density			p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			
(EU) No 305/2011 (CPR)			Dca-s2,d1,a1	Dca-s1a,d0,a1		EN 50575

p = passed

Glass-armoured multifiber loose tube cables TWINTUBE – up to 24 fibers



Properties

- Metal-free indoor and outdoor cable
- Rodent-protected, glass-armoured
- Ripcord for easy jacket removal
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- For installations directly in the ground and in mechanically unprotected environments
- As data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes
- Ideal for applications involving high safety requirements in case of a fire

Design

Cable design	2 multifiber loose tubes, jelly-filled with 2 x 12 fibers 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

48-.../W(ZNG)H-...94	U-DQ(ZN)BH 2 x n/125
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Please see page 185.

Specification				
CPR main class			Dca	
Jacket Ø	mm		8.8 × 9.4	
Number of fibers			2 × 24	
Approx. weight	kg/km		101	

Mechanical properties				
Tensile strength	during installation	N	3000	IEC 60794-1-2 E1
	in service	N	1500	
Min. bend radius	during installation	mm	150 ¹⁾	IEC 60794-1-2 E11
	in service	mm	100 ¹⁾	
Crush resistance	short-term	N/dm	8000 ¹⁾	IEC 60794-1-2 E3
	long-term	N/dm	4000 ¹⁾	
Water penetration	h = 1 m, 24 h, p < 3 m		p	IEC 60794-1-2 F5B

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-20 to +70	
	in storage	°C	-40 to +70	

Combustion properties				
Fire load		MJ/m	1.85	
Fire propagation	on a vertical single cable		p	IEC 60332-1-2
Fire test	with circuit integrity (CI)	min.	180	IEC 60331-25
Halogen acid gas	jacket material		p	IEC 60754-1
Degree of acidity	jacket material		p	IEC 60754-2
2011/65/EC (RoHS)			compliant	
(EU) No 305/2011 (CPR)			Dca-s2, d2, a1	EN 50575

p = passed

¹⁾ refers to the flat side of the cable

Glass-armoured multifiber loose tube cables – up to 144 fibers



Properties

- Metal-free indoor and outdoor cable
- Rodent protection, glass-armoured
- Ripcord for easy jacket removal
- Jacket material according to UL 94V-0
- Low smoke, halogen-free and self-extinguishing
- Longitudinal and transversal watertight cable

Applications

- Data cable in distribution networks
- For applications involving high safety requirements in case of fire

Design

Cable design	4 to 12 multifiber loose tube, jelly-filled with 2 to 12 fibers strength member 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	LSFH™
Jacket colour	black (optional with 2 orange stripes)

According to IEC 60794-1-2

Ordering information

24-.../BWSN(ZNG)H-...96	U-DQ(ZN)BH 2 x n/125
48-.../BWSN(ZNG)H-...96	U-DQ(ZN)BH 4 x n/125
72-.../BWSN(ZNG)H-...106	U-DQ(ZN)BH 6 x n/125
96-.../BWSN(ZNG)H-...122	U-DQ(ZN)BH 8 x n/125
144-.../BWSN(ZNG)H-...145	U-DQ(ZN)BH 12 x n/125

Please see page 185.

Specification			4	6	8	12	
CPR main class			Dca				
Number of fibers			24/48	72	96	144	
Jacket Ø		mm	9.6	10.6	12.2	14.5	
Multifiber loose tube			mini	mini	mini	mini	
Approx. weight		kg/km	109	119	151	220	

Mechanical properties							
Tensile strength	during installation	N	9000	9000	9000	9000	IEC 60794-1-2 E1
	in service	N	4000	4000	4000	4000	
Min. bend radius	during installation	mm	140	160	180	220	IEC 60794-1-2 E11
	in service	mm	100	110	120	150	
Crush resistance	short-term	N/dm	6000	6000	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	3000	3000	
Impact resistance	Wp = 2.21 J	impact	50	50	50	50	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	p	p	IEC 60794-1-2 F5A

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	bei in storage	°C	-40 to +70	

Combustion properties							
Fire load		MJ/m	1.9	2.3	3.0	4.3	
Fire propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	p	p	p	IEC 60332-3-25
Fire test with circuit integrity			90min	90min		90min	IEC 60331-25
Smoke density			p	p	p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				
(EU) No 305/2011 (CPR)			Dca-s1a,d0,a1				EN 50575

p = passed

Steel-armoured multifiber loose tube cables – simplex and TWINTUBE



Simplex – up to 24 fibers



TWINTUBE – up to 24 fibers

Properties

- Steel-armoured indoor and outdoor cable
- Rodent-protected (steel-armoured)
- For high mechanical and thermal requirements
- Low smoke, halogen-free and self-extinguishing
- Low fire load for high safety requirements

Applications

- For outdoor and indoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installations directly in the ground

Design

Cable design	1 to 2 multifiber loose tubes, jelly-filled with 2 to 24 fibers
Strain relief	aramid yarn/glass-roving
Rodent protection	steel-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

24-.../W(ZN)HAH-...80	U-DQ(ZN)H(ZS)H 1 x n/125
48-.../W(ZNG)HAH-...125	U-DQ(ZN)BH(ZS)H 2 x n/125

Please see page 186.

Specification			Simplex	TWINTUBE	
Jacket Ø		mm	8.0	12.5	
Number of fibers			2 to 24	2 × 24	
Multifiber loose tube		mm	standard	standard	
Approx. weight		kg/km	82	200	

Mechanical properties					
Tensile strength	during installation	N	3000	3000	IEC 60794-1-2 E1
	in service	N	1500	1500	
Min. bend radius	during installation	mm	120	190 ¹⁾	IEC 60794-1-2 E11
	in service	mm	80	125 ¹⁾	
Crush resistance	short-term	N/dm	4000	8000 ¹⁾	IEC 60794-1-2 E3
	long-term	N/dm	2000	4000 ¹⁾	

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-20 to +70	
	in storage	°C	-40 to +70	-40 to +70	

Combustion properties					
Fire load		MJ/m	1.32	3.35	
Fire propagation	on a vertical single cable		p	p	IEC 60332-3-22
Fire propagation	on a vertical cable bundle		p	p	IEC 60332-3-25
Smoke density			p	p	IEC 61034-2
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
Fire test	with circuit integrity (CI)	min.	180	180	IEC 60331-25
2011/65/EC (RoHS)			compliant		

p = passed

¹⁾ refers to the flat side of the cable

Steel-armoured multifiber loose tube cables – up to 72 fibers



Properties

- Steel-armoured indoor and outdoor cable
- Rodent-protected (steel-armoured)
- For use in ducts and unprotected environment
- For high mechanical requirements
- Low smoke, halogen-free and self-extinguishing

Applications

- For outdoor and indoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installations directly in the ground

Design

Cable design	4 to 6 multifiber loose tube, jelly-filled with 2 to 12 fibers strength member 2 ripcords
Strain relief	glass-roving
Rodent protection	steel-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

24-.../BWSN(ZNG)HAH-...130	U-DQ(ZN)BH(ZS)H 2 x n/125
48-.../BWSN(ZNG)HAH-...130	U-DQ(ZN)BH(ZS)H 4 x n/125
72-.../BWSW(ZNG)HAH-...140	U-DQ(ZN)BH(ZS)H 6 x n/125

Please see page 186.

Specification		4	6	
Jacket Ø	mm	13.0	14.0	
Number of fibers		24/48	72	
Multifiber loose tube		mini	mini	
Approx. weight	kg/km	220	246	

Mechanical properties					
Tensile strength	during installation	N	9000	9000	IEC 60794-1-2 E1
	in service	N	4000	4000	
Min. bend radius	during installation	mm	200	210	IEC 60794-1-2 E11
	in service	mm	130	140	
Crush resistance	short-term	N/dm	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	
Impact resistance	Wp = 2.21 J	impacts	50	50	IEC 60794-1-2 E4

Thermal properties					
Temperature range	during installation	°C	-10 to +50		IEC 60794-1-22 F1
	in service	°C	-40 to +70		
	in storage	°C	-40 to +70		

Combustion properties					
Fire load		MJ/m	3.6	4.1	
Fire propagation	on a vertical single cable		p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle cable		p	p	IEC 60332-3-25
Halogen acid gas	jacket material		p	p	IEC 60754-1
Degree of acidity	jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant		

p = passed

Outdoor cables

	Cable type	Page	Ordering key	Weight kg/km	Amount of fibers
	Non-armoured multifiber loose tube up to 24 fibers	114	12-.../BW(ZN)V-...35 24-.../W(ZN)Y-...50	9.6 20	2 up to 12 2 up to 24
	Glass-armoured multifiber loose tube up to 24 fibers	116	24-.../W(ZNG)Y-...70 24-.../W(ZNG)Y-...85 24-.../W(ZNG)Y-...120	63 63 135	2 up to 24 2 up to 24 2 up to 24
	Glass-armoured multifiber loose tube TWINTUBE, up to 24 fibers	118	24-.../W(ZNG)Y-...94	69	up to 24
	Glass-armoured multifiber loose tube up to 144 fibers	120	24-.../BWSN(ZNG)V-...96 48-.../BWSN(ZNG)V-...96 72-.../BWSN(ZNG)V-...106 96-.../BWSN(ZNG)V-...122 144-.../BWSN(ZNG)V-...145	84 84 97 130 194	up to 48 up to 48 up to 72 up to 96 up to 144
	Steel-armoured multifiber loose tube up to 24 fibers	122	24-.../W(ZN)YAY-...80	70	2 up to 24
	Steel-armoured multifiber loose tube TWINTUBE up to 24 fibers	122	24-.../W(ZNG)YAY-...125	152	up to 24
	Steel-armoured multifiber loose tube up to 72 fibers	124	48-.../BWSN(ZNG)VAV-...130 72-.../BWSN(ZNG)VAV-...140	179 185	up to 48 up to 72

p = passed

Multifiber loose tube	Jacket Ø mm	Jacket material	Rodent protection	Tensile strength N	Crush resistance N/dm	Temperature range (in service) °C
mini standard	3.5 5.0	PE PE		900 1000	3000 3000	-40 to +70 -40 to +70
standard standard standard	7.0 8.5 12.0	PE PE PE	p p p	2000 3000 9000	5000 10 000 12 000	-40 to +70 -40 to +70 -40 to +70
standard	8.8 × 9.4	PE	p	3000	8000	-20 to +70
mini mini mini mini mini	9.6 9.6 10.6 12.2 14.5	PE PE PE PE PE	p p p p p	9000 9000 9000 9000 9000	8000 8000 8000 8000 8000	-40 to +70 -40 to +70 -40 to +70 -40 to +70 -40 to +70
standard	8.0	PE	p	3000	4000	-40 to +70
standard	12.5	PE	p	3000	8000	-20 to +70
mini mini	13.0 14.0	PE PE	p p	9000 9000	8000 8000	-40 to +70 -40 to +70

Non-armoured multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free outdoor cable
- Strain relieved with aramide yarn
- For use in ducts and unprotected environment
- High chemical resistance against acids and alkalies
- Halogen-free and non-corrosive fire gases

Applications

- Data cable in distribution networks
- For outdoor installations in humid and wet cable ducts

Design

Cable design	multifiber loose tube with 2 up to 24 fibers, jelly-filled
Strain relief	aramide yarn
Jacket material	PE
Jacket colour	black or colour coded

According to IEC 60794-1-2

Ordering information

up to 12-.../BW(ZN)V-...35	A-D(ZN)2Y 1 x n/125
up to 24-.../W(ZN)Y-...50	A-D(ZN)2Y 1 x n/125

Please see page 187.

Specification					
Jacket Ø	mm	3.5	5.0		
Number of fibers		2 to 12	2 to 24		
Multifiber loose tube		mini	standard		
Approx. weight	kg/km	9.6	20		

Mechanical properties					
Tensile strength	during installation	N	900	1000	IEC 60794-1-2 E1
	in service	N	250	400	
Min. bend radius	during installation	mm	50	80	IEC 60794-1-2 E11
	in service	mm	35	50	
Crush resistance	short-term	N/dm	3000	3000	IEC 60794-1-2 E3
	long-term	N/dm	1000	1500	
Impact resistance	Wp = 1.4 J Wp = 2.21 J	impacts	50	50	IEC 60794-1-2 E4
Repeated bending	r = 35 mm/1 kg r = 50 mm/1 kg	cycles	5000	5000	IEC 60794-1-2 E6

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-40 to +70	
	in storage	°C	-40 to +70	-40 to +70	

Combustion properties					
Fire load	MJ/m	0.32	0.75		
2011/65/EC (RoHS)		compliant			

p = passed

Glass-armoured multifiber loose tube cables – up to 24 fibers



Properties

- Metal-free outdoor cable
- Rodent protection, glass-armoured
- For use in ducts and in unprotected environment
- High chemical resistance against acids and alkalies
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Longitudinal and transversal watertight cable

Applications

- For installation directly in the ground and in mechanically unprotected environments
- Data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes

Design

Cable design	multifiber loose tube with 2 up to 24 fibers, jelly-filled
Strain relief and rodent protection	glass-roving
Jacket material	PE
Jacket colour	black

According to IEC 60794-1-2

Ordering information

up to 24-.../W(ZNG)Y-...70	A-DQ(ZN)B2Y 1 x n/125
up to 24-.../W(ZNG)Y-...85	A-DQ(ZN)B2Y 1 x n/125
up to 24-.../W(ZNG)Y-...120	A-DQ(ZN)B2Y 1 x n/125

Please see page 187, 188.

Specification						
Jacket Ø	mm	7.0	8.5	12.0		
Number of fibers each bundle		2 to 24	2 to 24	2 to 24		
Multifiber loose tube		standard	standard	standard		
Approx. weight	kg/km	42	62	135		

Mechanical properties						
Tensile strength	during installation	N	2000	3000	12 000	IEC 60794-1-2 E1
	in service	N	1200	1500	6000	
Min. bend radius	during installation	mm	110	130	180	IEC 60794-1-2 E11
	in service	mm	70	80	120	
Crush resistance	short-term	N/dm	5000	10 000	12 000	IEC 60794-1-2 E3
	long-term	N/dm	2000	3000	6000	
Impact resistance	Wp = 4.41 J Wp = 4.5 J	impacts	10	30	100	IEC 60794-1-2 E4
Repeated bending	r = 80 mm r = 120 mm	cycles	3000	5000	5000	IEC 60794-1-2 E6
Torsion	± 1440° ± 360°	cycles	3	3	3	IEC 60794-1-2 E7
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	p	IEC 60794-1-2 F5B

Thermal properties						
Temperature range	during installation	°C	-10 to +50	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-40 to +70	-40 to +70	
	in storage	°C	-40 to +70	-40 to +70	-25 to +70	

Combustion properties						
Fire load	MJ/m	1.3	1.6	3.4		
2011/65/EC (RoHS)		compliant				

p = passed

Glass-armoured multifiber loose tube cables TWINTUBE – up to 24 fibers



Properties

- Metal-free outdoor cable
- Rodent-protected, glass-armoured
- For use in ducts and unprotected environment
- Ripcord for easy jacket removal
- High chemical resistance against acids and alkalis
- Halogen-free and non-corrosive fire gases
- Longitudinal and transversal watertight cable

Applications

- For installations directly in the ground and in mechanically unprotected environments
- Data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes

Design

Cable design	2 multifiber loose tubes, jelly-filled with up to 2 × 12 fibers 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	PE
Jacket colour	black

According to IEC 60794-1-2

Ordering information

up to 24-.../W(ZNG)Y-...94	A-DQ(ZN)B2Y 2 x n/125
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Please see page 189.

Specification			
Jacket Ø	mm	8.8 × 9.4	
Number of fibers		2 × 24	2 up to 12 Fasern
Approx. weight	kg/km	69	

Mechanical properties				
Tensile strength	during installation	N	3000	IEC 60794-1-2 E1
	in service	N	1500	
Min. bend radius	during installation	mm	150 ¹⁾	IEC 60794-1-2 E11
	in service	mm	100 ¹⁾	
Crush resistance	short-term	N/dm	8000 ¹⁾	IEC 60794-1-2 E3
	long-term	N/dm	4000 ¹⁾	
Repeated bending	r = 150 mm, weight = 5 kg	cycles	5000 ¹⁾	IEC 60794-1-2 E6
Water penetration	h = 1 m, 24 h, p < 3 m		p	IEC 60794-1-2 F5B

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-20 to +70	
	in storage	°C	-40 to +70	

Combustion properties			
Fire load	MJ/m	1.8	
2011/65/EC (RoHS)		compliant	

p = passed

1) refers to the flat side of the cable

Glass-armoured multifiber loose tube cables – up to 144 fibers



Properties

- Metal-free outdoor cable
- Rodent protection, glass-armoured
- For use in ducts and unprotected environment
- Ripcord for easy jacket removal
- High chemical resistance against acids and alkalies
- Halogen-free and non-corrosive fire gases
- Longitudinal and transversal watertight cable

Applications

- For installation directly in the ground and in mechanically unprotected environments
- Data cable in distribution networks
- For installation outdoor, in wet cable ducts and pipes

Design

Cable design	4 to 12 multifiber loose tube, jelly-filled with 2 to 12 fibers strength member 2 ripcords
Strain relief and rodent protection	glass-roving
Jacket material	PE
Jacket colour	black with 2 orange stripes

According to IEC 60794-1-2

Ordering information

24-.../BWSN(ZNG)V-...96	A-DQ(ZN)B2Y 2 x n/125
48-.../BWSN(ZNG)V-...96	A-DQ(ZN)B2Y 4 x n/125
72-.../BWSN(ZNG)V-...106	A-DQ(ZN)B2Y 6 x n/125
96-.../BWSN(ZNG)V-...122	A-DQ(ZN)B2Y 8 x n/125
144-.../BWSN(ZNG)V-...145	A-DQ(ZN)B2Y 12 x n/125

Please see page 189.

Specification		4	6	8	12	
Fiber up to		24/48	72	96	144	
Jacket Ø	mm	9.6	10.6	12.2	14.5	
Multifiber loose tube		mini	mini	mini	mini	
Approx. weight	kg/km	84	97	121	176	

Mechanical properties							
Tensile strength	during installation	N	9000	9000	9000	9000	IEC 60794-1-2 E1
	in service	N	4000	4000	4000	4000	
Min. bend radius	during installation	mm	140	160	180	220	IEC 60794-1-2 E11
	in service	mm	100	110	120	150	
Crush resistance	short-term	N/dm	6000	6000	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	3000	3000	
Impact resistance	Wp = 2.21 J	impacts	50	50	50	50	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		b	b	b	b	IEC 60794-1-2 F5B

Thermal properties					
Temperature range	during installation	°C	-10 to +50		IEC 60794-1-22 F1
	in service	°C	-40 to +70		
	in storage	°C	-40 to +70		

Combustion properties						
Fire load	MJ/m	2.1	2.5	3.3	4.7	
2011/65/EC (RoHS)		compliant				

p = passed

Steel-armoured multifiber loose tube cables – simplex and TWINTUBE



Simplex – up to 24 fibers



TWINTUBE – up to 24 fibers

Properties

- Steel-armoured outdoor cable
- Rodent-protected (steel-armoured)
- High chemical resistance against acids and alkalies
- Halogen-free and non-corrosive fire gases

Applications

- For outdoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installations directly in the ground

Design

Cable design	1 to 2 multifiber loose tubes, jelly-filled with 2 to 24 fibers
Strain relief	aramid yarn/glass-roving
Rodent protection	steel-armoured
Jacket material	PE
Jacket colour	black

According to IEC 60794-1-2

Ordering information

up to 24-.../W(ZN)YAY-...80	A-DQ(ZN)2Y(ZS)2Y 2 x n/125
up to 48-.../W(ZNG)YAY-...125	A-DQ(ZN)2Y(ZS)2Y 2 x n/125

Please see page 189, 190.

Specification		Simplex	TWINTUBE	
Jacket Ø	mm	8.0	12.5	
Number of fibers		24	2 × 24	
Multifiber loose tube		standard	standard	
Approx. weight	kg/km	70	152	

Mechanical properties					
Tensile strength	during installation	N	3000	3000	IEC 60794-1-2 E1
	in service	N	1500	1500	
Min. bend radius	during installation	mm	120	190*	IEC 60794-1-2 E11
	in service	mm	80	125*	
Crush resistance	short-term	N/cm	4000	8000*	IEC 60794-1-2 E3
	long-term	N/cm	2000	4000*	
Impact resistance	Wp = 4.41 J	impacts	50		IEC 60794-1-2 E4
	Wp = 15 J	impacts		3	

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-20 to +70	
	in storage	°C	-40 to +70	-40 to +70	

Combustion properties				
Fire load	MJ/m	1.78	3.51	
2011/65/EC (RoHS)		compliant		

p = passed

Steel-armoured multifiber loose tube cables – up to 72 fibers



Properties

- Steel-armoured outdoor cable
- Rodent-protected (steel-armoured)
- For use in ducts and unprotected environment
- Halogen-free and non-corrosive fire gases

Applications

- For outdoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installation directly in the ground

Design

Cable design	4 to 6 multifiber loose tubes, jelly-filled with 2 to 12 fibers strength member 2 ripcords
Strain relief	glass-roving
Rodent protection	steel-armoured
Jacket material	PE
Jacket colour	black

According to IEC 60794-1-2

Ordering information

24-.../BWSN(ZNG)VAV-...130	A-DQ(ZN)2Y(ZS)2Y 2 x n/125
48-.../BWSN(ZNG)VAV-...130	A-DQ(ZN)2Y(ZS)2Y 4 x n/125
72-.../BWSW(ZNG)VAV-...140	A-DQ(ZN)2Y(ZS)2Y 6 x n/125

Please see page 190.

Specification		4	6	
Jacket Ø	mm	13.0	14.0	
Fiber quantity up to		24/48	72	
Multifiber loose tube		mini	mini	
Approx. weight	kg/km	173	185	

Mechanical properties					
Tensile strength	during installation	N	9000	9000	IEC 60794-1-2 E1
	in service	N	4000	4000	
Min. bend radius	during installation	mm	200	210	IEC 60794-1-2 E11
	in service	mm	130	140	
Crush resistance	short-term	N/dm	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	3000	
Impact resistance	Wp = 2.21 J	impacts	50	50	IEC 60794-1-2 E4

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +70	
	in storage	°C	-40 to +70	

Combustion properties				
Fire load	MJ/m	4.0	4.4	
2011/65/EC (RoHS)		compliant		

p = passed

Special cables

	Cable type	Page	Ordering key	Weight kg/km	Amount of fibers
	Simplex cables with tight tube	130	01-.../FJZ-...19	3	1
	Rugged simplex cables	132	01-.../FJH(ZN)Z-...27	40	1
	Industry Link TWINFLEX and rugged minicord breakout cables	134	02-.../FJ(ZN)Z-...17 02-.../...(ZN)Z-...22	28 46	2 2
	Industry Link TWINFIX	136 138	02-.../...(ZNG)H-...22 02-.../...(ZNG)R-...22	61	2 2
	Industry link QUADFIX	140	04-.../FJSN(ZNG)H-...22 04-H200/VJSN(ZNG)H-...22	91	4
	Aramid-free simplex cable	142	01-.../FH-...20 01-.../VH-...20	4.5 4.5	1 1
	Aramid-free breakout cable 2.0 mm	144	16-.../FSNH-...20 16-.../VSNH-...20 18-.../FSNH-...20 18-.../VSNH-...20	138 138 162 162	16 16 18 18
	Mobile field cable flexible loose tube	146	12-.../EW(ZN)Z-...60	26	up to 12
	Mobile field cables	148	02-.../FSN(ZN)Z-...56 04-.../FSN(ZN)Z-...56 08-.../FSN(ZN)Z-...68 12-.../FSN(ZN)Z-...80	24 26 40 53	2 4 8 12
	Glass-armoured riser cables 2 tubes	150	02-.../F(ZNG)H-...48 02-.../F(ZNG)H-...55 02-.../F(ZNG)H-...70	26 35 55	2 2 2
	Glass-armoured riser cables 4 tubes	152	04-.../FSN(ZNG)H-...55	33	4
	Rugged multifiber loose tube up to 24 fibers (dry)	154	24-.../Q(ZNG)Z-...70	44	2 to 24

Amount of conductors	Tube Ø mm	Simplex cable Ø mm	Jacket Ø mm	Jacket material	Direct connection N	Tensile strength N	Crush resistance N/dm	Temperature range in service °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
	0.9		1.9	TPU	·	180	10 000	-40 to +85			
	0.9	2.7	6.0	TPU	·	4000	20 000	-25 to +70			
	0.9 0.9	1.7 2.2	6.0 7.5 × 8	TPU TPU	· ·	2000 2000	6000 6000	-40 to +70 -40 to +70			
	0.9 0.9	2.2 2.2	7.5x7.2 7.5x7.2	LSFH™ RA-DOX®	· ·	2000 4000	6000 6000	-40 to +70 -45 to +75	p p	p p	Dca-s1a, d0, a1
	0.9	2.2	9.0	LSFH™	·	2000	15 000	-40 to +70	p	p	Cca-s1a, d0, a1
	0.9 0.5		2.0 2.0	LSFH LSFH®	* *	100 100	1000 3000	-45 to +85 -45 to +85	p p	p p	
	0.9 0.5 0.9 0.5	2.0 2.0 2.0 2.0	12.0 12.0 13.0 13.0	LSFH LSFH LSFH LSFH	* * * *	700 700 1000 1000	10000 10000 10000 10000	-45 to +85 -45 to +85 -45 to +85 -45 to +85	p p p p		
			6.0	TPU	*	4000	10000	-45 to +85			
	0.9 0.9 0.9 0.9		5.6 5.6 6.8 8.0	TPU TPU TPU TPU	· · · ·	4000 4000 4000 4000	21 000 21 000 21 000 10 000	-60 to +85 -60 to +85 -60 to +85 -60 to +85			
	0.9 0.9 0.9		4.8 5.5 7.0	LSFH™ LSFH™ LSFH™	· · ·	1000 1000 1000	20 000 20 000 20 000	-40 to +75 -40 to +75 -40 to +75	p p p	p p p	Dca-s2, d0, a1 Dca-s1a, d0, a1 Dca-s2a, d1, a1
	0.9		5.5	LSFH™	·	1000	20 000	-40 to +75	p	p	
			7.0	TPU		2500	9000	-45 to +85			

Special cables

	Cable type	Page	Ordering key	Weight kg/km	Amount of fibers
	RADOX® loose tube cable up to 24 fibers	156	24-.../W(ZNG)R-...-85	88	up to 24
	Steel armoured multi-fiber loose tube cable, up to 24 fibers	158	24-.../W(ZN)HAR-...82_DNV 24-.../W(ZN)HAH-...80 24-.../Q(ZN)HAU-...80	115 87 100	up to 24 up to 24 up to 24
	DNV GL type approved multifiber loose tube cable – steel armoured, up to 24 fibers	160	24-.../W(ZN)HAR-...82_DNV	115	up to 24
	DNV GL type approved multifiber loose tube	160	24-.../W(ZNG)H-...120	178	up to 24
	Drag chain cables	162	12-.../FSN(ZN)YZ-...130	128	up to 12
	RADOX® drag chain cable	164	12-.../FSN(ZN)YR-...130	160	up to 12
 	Hybrid cables	166	04-.../CWJSNH-...27+...-C15 08-.../CWJSNH-...27+...-C15 60-.../WSN(ZNG)Y-...150+...-C... 96-.../WSN(ZNG)Y-...180+...-C...		up to 4 up to 8 up to 60 up to 96

p = passed

Amount of conductors	Tube Ø mm	Simplex cable Ø mm	Jacket Ø mm	Jacket material	Direct connection termination N	Tensile strength N	Crush resistance N/dm	Temperature range in service °C	Fire propagation IEC 60332-1-2	Fire propagation IEC 60332-3	CPR 2011/305/EU
standard	8.5	RA-DOX®	p	3000	10 000	-60 to +85	p	p	Cca-sla, d0, a1		
			8.2 8.0 8.0	RA-DOX® LSFH™ TPU		3750 3000 3000	8000 4000 4000	-50 to +85 -40 to +70 -70 to 85	p p p	p p	
			8.2	RA-DOX®		3750	2000	-50 to +85	p	p	
			12	LSFH™		9000	6000	-40 to +70	p	p	
	0.9		13.0	TPU	•	4000	4000	-50 to +85			
	0.9		13.0	RA-DOX®	•	4000	1500	-30 to +85	p		
up to 3 up to 4 up to 4 up to 4	0.9 0.9 3.0 3.0	2.7 2.7 2.5 2.5	10.0 13.0 15.0 8.0	LSFH™ LSFH™ PE PE	• •	2000 4000 9000 13 000	10 000 10 000 8000 8000	-20 to +70 -20 to +70 -40 to +70 -40 to +70	p p	p	

Simplex cables with tight tube



Properties

- Metal-free indoor and outdoor cable
- Strain relieved with aramide yarn
- For direct connector assembly with strain relief
- Tight bend radii
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases

Applications

- For outdoor and indoor installations
- Patch cable in distribution centres

Design

Tube	tight tube 0.9 mm	
Strain relief	aramide yarn	
Jacket material	TPU	
Jacket colour	E9	yellow
	G50 – OM2	orange
	G50 – OM3	turquoise
	G50 – OM4	heather violet
	G62.5 – OM1	orange

According to IEC 60794-1-2

Ordering information

01-.../FJZ-...19	A-V(ZN)11Y 1...
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Please see page 191.

Specification				
Jacket Ø		mm	1.9	
Tube Ø		mm	0.9	
Approx. weight		kg/km	3	
Mechanical properties				
Tensile strength	during installation	N	180	IEC 60794-1-2 E1
	in service	N	90	
Min. bend radius ¹⁾	during installation	mm	50	IEC 60794-1-2 E11
	in service	mm	25	
Crush resistance	short-term	N/dm	10 000	IEC 60794-1-2 E3
	long-term	N/dm	2000	
Impact resistance	Wp = 0.74 J	impacts	30	IEC 60794-1-2 E4
Repeated bending	r = 30 mm, weight = 1 kg	cycles	2500	IEC 60794-1-2 E6
Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F12
	in service	°C	-40 to +85	
	in storage	°C	-40 to +85	
Combustion properties				
Fire load		MJ/m	0.11	
2011/65/EC (RoHS)			compliant	

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimized.

Rugged simplex cables



Properties

- Metal-free indoor and outdoor cable
- Strain relieved with aramide yarn
- For direct connector assembly with strain relief
- High chemical resistance against acids and alkalies
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Improved crash resistance

Applications

- Industry LAN
- Mobile data cablings in harsh environment
- Machinery cablings, drag chains

Design

Cable design	1 single-fiber cable with tight tubes
Strain relief	aramide yarn
Jacket material	Inner jacket LSFH / Outer jacket TPU
Jacket colour	According to colour code

According to IEC 60794-1-2

Ordering information

01-.../FJH(ZN)Z-...27	AT-V(ZN)H(ZN)11Y 1...
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Please see page 191.

Specification				
Jacket Ø	mm	6.0		
Single-fiber cable Ø	mm	2.7		
Tube Ø	mm	0.9		
Approx. weight	kg/km	40		

Mechanical properties				
Tensile strength	during installation	N	4000	IEC 60794-1-2 E1
	in service	N	1500	
Min. bend radius	during installation	mm	90	IEC 60794-1-2 E11
	in service	mm	60	
Crush resistance	short-term	N/dm	20 000	IEC 60794-1-2 E3
	long-term	N/dm	10 000	
Impact resistance	Wp = 2.25 J	impacts	150	IEC 60794-1-2 E4
Repeated bending	r = 30 mm, weight = 2.5 kg	cycles	10 000	IEC 60794-1-2 E6
Flexing	r = 77 mm velocity = 2.2 m/s L = 2 m	cycles	100 000	HUBER+SUHNER drag chain test

Thermal properties				
Temperature range	during installation	°C	-10 to +60	IEC 60794-1-22 F1
	in service	°C	-25 to +70	
	in storage	°C	-40 to +70	

Combustion properties				
Fire load		MJ/m	0.57	
Halogen acid gas	Jacket material		p	IEC 60754-1
Degree of acidity	Jacket material		p	IEC 60754-2
2011/65/EC (RoHS)			compliant	

p = passed

Industry Link TWINFLEX and rugged minicord breakout cables



Rugged minicord breakout



Industry Link TWINFLEX

Properties

- Metal-free indoor and outdoor cable
- For direct connector assembly with strain relief
- Strain relieved with aramide yarn
- Ripcord for easy jacket removal
- Halogen-free and non-corrosive fire gases
- Improved crush resistance
- For high thermal and mechanical stability
- High chemical resistance against acids and alkalis
- High abrasive resistance

Applications

- For flexible, moved and fixed use
- Industrial Ethernet and LAN
- Machine cabling, drag chains
- As control or data cable in factory automation
- Mobile data cabling for harsh environment
- Connection to outdoor devices

Design

Cable design	2 Single-fiber cables with tight tubes 1 ripcord
Strain relief	aramide yarn
Jacket material	TPU
Jacket colour	black

According to IEC 60794-1-2

Ordering information

Rugged minicord breakout	02-.../FJ(ZN)Z-...17	AT-V(ZN)H(ZN)11Y 2...
TWINFLEX	02-.../...(ZN)Z-...22	AT-V(ZN)Z(ZN)11Y 2...

Please see page 191.

Conformance

TWINFLEX cables with H200 and POF meet PROFINET specification.

Specification								
Cable type			rugged minicord breakout		Industry Link TWINFLEX			
Fiber types			E9, G50, G62	H200	G50, G62	H200	POF980	
Jacket Ø	mm	6.0		7.5 × 8.0				
Single-fiber cable Ø	mm	1.7		2.2				
Tube Ø	mm	0.9	0.9	0.9	0.5	2.2		
Channel marking on single-fiber			numbered		black and orange with arrows			
Approx. weight	kg/km	28		46				

Mechanical properties								
Tensile strength	during installation	N	2000	2000	2000	2000	2000	IEC 60794-1-2 E1
	in service	N	1000	500	1000	1000	1000	
Min. bend radius	during installation	mm	25	25	40	60	25	IEC 60794-1-2 E11
	in service	mm	25	25	25	50	25	
Crush resistance	short-term	N/dm	6000	2000	6000	6000	6000	IEC 60794-1-2 E3
	long-term	N/dm	2000	1000	2000	2000	4000	
Impact resistance	Wp = 1.5 J Wp = 2.2 J	im-pacts	200	200	200	200	200	IEC 60794-1-2 E4
Repeated bending	r = 30 mm/10 kg r = 60 mm/1 kg	cycles	20 000		10 000	10 000	10 000	IEC 60794-1-2 E6
Flexing	r = 77 mm	cycles	100 000					HUBER+SUHNER ¹⁾
Flexing	r = 70 mm r = 80 mm	cycles			100 000	100 000	100 000	IEC 60794-1-2 E8 IEC 60794-1-2 E8
Torsion	± 360° ± 1440°	cycles	3		100	10	10	IEC 60794-1-2 E7

Thermal properties						
Temperature range	during installation	°C	-20 to +60	-10 to +60	-30 to +70	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-20 to +70	-30 to +70	
	in storage	°C	-40 to +70	-25 to +70	-30 to +70	

Combustion properties							
Fire load	MJ/m	0.6	0.6	0.75	0.75	0.93	
2011/65/EC (RoHS)		compliant					

Conformance							
PROFINET	Specification ²⁾					yes	yes

¹⁾ Drag chain test

²⁾ Standard with H+S marking. According to PROFINET specification with PROFINET marking (PROFINET Type C 2K200/230 or PROFINET Type C 2P980/1000)

Industry Link TWINFIX – glass-armoured breakout cables



Properties

- Metal-free indoor and outdoor cable
- For direct connector assembly with strain relief
- Rodent-protected, glass-armoured
- Easy stripping
- Low smoke, halogen-free and self-extinguishing
- Improved crush resistance
- For high thermal and mechanical stability
- UV protected, suitable for outdoor use
- Longitudinal and transversal watertight cable

Applications

- For fixed installation
- Industrial Ethernet and LAN
- Machine cabling
- As control or data cable in factory automation
- Data cabling for harsh environment
- Connection to outdoor devices
- LSFH™ – for applications involving high safety requirements in case of fire

Design

Cable design	2 single-fiber cables with tight tubes
Strain relief	glass-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

02-.../(ZNG)H-...22	UT-VQ(ZN)H(ZN)BH 2...
02-.../(ZNG)H-...22_UN (optional)	

Please see page 192.

Approvals

UL listed acc. OFN/OFNG

Specification						
CPR main class			Dca			
Cable type			Industry Link TWINFIX			
Fiber types			E9 G50, G62	H200	POF980	
Jacket Ø	mm		7.5 × 7.2	7.5 × 7.2	7.5 × 7.2	
Single-fiber cable Ø	mm		2.2	2.2		
Tube Ø	mm		0.9	0.9	2.2	
Channel marking on single-fiber			black and orange with arrows			
Approx. weight	kg/km		61	67	67	

Mechanical properties						
Tensile strength	during installation	N	2000	2000	2000	IEC 60794-1-2 E1
	in service	N	1000	1000	1000	
Min. bend radius	during installation	mm	40	105	25	IEC 60794-1-2 E11
	in service	mm	25	70	25	
Crush resistance	short-term	N/dm	6000	6000	5000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	2000	
Impact resistance	Wp = 2.2 J	impacts	200	200	200	IEC 60794-1-2 E4
Repeated bending	r = 60 mm/1 kg	cycles	10 000	10 000	10 000	IEC 60794-1-2 E6
Torsion	± 360°	cycles	10	10	10	IEC 60794-1-2 E7
Water penetration	h = 1 m, 24 d., p < 3 m		p	p	p	IEC 60794-1-2 F5A

Thermal properties						
Temperature range	during installation	°C	-10 to +60	-10 to +60	-10 to +60	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-20 to +70	-30 to +70	
	in storage	°C	-45 to +70	-25 to +70	-30 to +70	

Combustion properties						
Fire load		MJ/m	1.15	1.1	1.25	
Fire propagation	on a vertical cable bundle		p	p		IEC 60332-3-24
Fire test	with circuit integrity (CI)	min	90	90		IEC 60331-25
Halogen acid gas	Jacket material		p	p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			

Conformance						
PROFINET	specification ¹⁾			yes	yes	
(EU) No 305/2011 (CPR)			Dca-s1a, d0, a1			EN 50575

p = passed

¹⁾ Standard black jacket and with H+S marking. According to PROFINET specification with green jacket and PROFINET marking (PROFINET Type B 2K200/230 or PROFINET Type B 2P980/1000)

Industry Link RADOX® TWINFIX – glass-armoured breakout cables



Properties

- Metal-free indoor and outdoor cable
- For direct connector assembly with strain relief
- Rodent-protected, glass-armoured
- Easy stripping
- Low smoke, halogen-free and self-extinguishing
- Improved crush resistance
- For high thermal and mechanical stability
- UV-protected, suitable for outdoor use
- Longitudinal and transversal watertight cable

Applications

- For fixed installation
- Industrial Ethernet and LAN
- Machine cabling
- As control or data cable in industrial plants
- Cabling in harsh environment conditions
- Connection to outdoor devices

Design

Cable design	2 single-fiber cables with tight tubes
Strain relief	glass-armoured
Jacket material	RADOX®
Jacket colour	black

According to IEC 60794-1-2

Ordering information

02-.../(...)(ZNG)R-...22	UT-VQ(ZN)H(ZN)BH 2...
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Please see page 192.

Specification					
Cable type			Industry Link TWINFIX		
Fiber types			E9 G50	H200	
Jacket Ø	mm		7.5 × 7.2	7.5 × 7.2	
Single-fiber cable Ø	mm		2.2	2.2	
Tube Ø	mm		0.9	0.9	
Channel marking on single-fiber			black and orange with arrows		
Approx. weight	kg/km		68	68	

Mechanical properties					
Tensile strength	during installation	N	4000	4000	IEC 60794-1-2 E1
	in service	N	2 x 100	2 x 100	
Min. bend radius	during installation	mm	40	70	IEC 60794-1-2 E11
	in service	mm	25	40	
Crush resistance	short-term	N/dm	12000	6000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	
Impact resistance	Wp = 2.2 J	impacts	50	200	IEC 60794-1-2 E4
Repeated bending	r = 60 mm/1 kg	cycles	10 000	10 000	IEC 60794-1-2 E6
Torsion	± 360°	cycles	15000	15000	IEC 60794-1-2 E7
Water penetration	h = 1 m, 24 d, p < 3 m		p	p	IEC 60794-1-2 F5A

Thermal properties					
Temperature range	during installation	°C	-20 to +70	-20 to +70	IEC 60794-1-22 F1
	in service	°C	-45 to +75	-50 to +75	
	in storage	°C	-45 to +75	-50 to +75	

Combustion properties					
Fire load		MJ/m	0.8	0.8	
Fire propagation	on a vertical cable bundle		p	p	IEC 60332-3-25
Halogen acid gas	Jacket material		p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant		
Hazard level 3			compliant		EN 45545

b = passed

Industry Link QUADFIX – glass-armoured breakout cables



Properties

- Metal-free indoor and outdoor cable
- Rodent-protected, glass-armoured
- For direct connector assembly with strain relief
- Easy stripping
- UV-protected, suitable for outdoor use
- For high thermal and mechanical stability
- Low smoke, halogen-free and self-extinguishing
- Improved crush resistance
- Longitudinal and transversal watertight cable

Applications

- For fixed installation
- Industrial Ethernet and LAN
- As control or data cable in industrial plants
- Cabling in harsh environment conditions
- LSFH™ – for applications involving high safety requirements in case of fire

Design

Cable design	4 single-fiber cables with tight tubes
Strain relief	glass-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

04-.../FJSN(ZNG)H-...22	UT-VQ(ZN)H(ZN)BH 4...
04-H200/VJSN(ZNG)H-...22	UT-VQ(ZN)H(ZN)BH 4...

Please see page 192.

Approvals

UL listed acc. OFN/OFNG

Specification					
CPR main class			Cca		
Cable type			Industry Link QUADFIX		
Fiber types			E9 G50, G62	H200	
Jacket Ø	mm	9	9		
Single-fiber cable Ø	mm	2.2	2.2		
Tube Ø	mm	0.9	0.5		
Approx. weight	kg/km	91	87		

Mechanical properties					
Tensile strength	during installation	N	2000	2000	IEC 60794-1-2 E1
	in service	N	1000	1000	
Min. bend radius	during installation	mm	135	135	IEC 60794-1-2 E11
	in service	mm	90	90	
Crush resistance	short-term	N/dm	15 000	6000	IEC 60794-1-2 E3
	long-term	N/dm	4000	2000	
Impact resistance	Wp = 2.2 J	impacts	200	200	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	IEC 60794-1-2 F5A

Thermal properties					
Temperature range	during installation	°C	-10 to +60	-10 to +60	IEC 60794-1-22 F1
	in service	°C	-40 to +70	-20 to +70	
	in storage	°C	-40 to +70	-25 to +70	

Combustion properties					
Fire load		MJ/m	1.63	1.62	
Fire propagation	on a vertical cable bundle		p	p	IEC 60332-3-24
Fire test	with circuit integrity (CI)	min	180	180	IEC 60331-25
Halogen acid gas	Jacket material		p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant	compliant	
(EU) No 305/2011 (CPR)			Cca-s1a, d0, a1		EN 50575

p = passed

Aramide-free simplex cable



Properties

- Metal-free indoor and outdoor cable
- Strain relief with aramide yarn
- For direct connector assembly with strain relief
- Tight bending radii
- For high thermal and mechanical stability
- Halogen-free and non-corrosive fire gases

Applications

- Installation in indoor and outdoor areas
- Patch cables in distribution centres

Design

Tube	Tight tube 0.9 mm, 0.5 mm
Jacket material	LSFH
Jacket colour	black

According to IEC 60794-1-2

Ordering information

01-.../FH-...20	I-V(ZN)11Y 1...
01-.../VH-...20	I-V(ZN)11Y 1...

Please see page 192.

Specification					
Fiber types		E9, G50, G62	H200		
Jacket Ø	mm	2.0	2.0		
Tube Ø	mm	0.9	0.5		
Approx. weight	kg/km	4.5	4.5		

Mechanical properties					
Tensile strength	during installation	N	100	100	IEC 60794-1-2 E1
	in service	N	50	50	
Min. bend radius	during installation	mm	20	30	IEC 60794-1-2 E11
	in service	mm	15	20	
Crush resistance	short-term	N/dm	1000	3000	IEC 60794-1-2 E3
	long-term	N/dm	250	1000	
Impact resistance	Wp = 0.74 J	impacts	10	3	IEC 60794-1-2 E4
Repeated bending	r = 30 mm, weight = 1 kg	cycles	100	1000	IEC 60794-1-2 E6

Thermal properties					
Temperature range	during installation	°C	-25 to +75	-25 to +75	IEC 60794-1-22 F12
	in service	°C	-45 to +85	-45 to +85	
	in storage	°C	-45 to +85	-55 to +85	

Combustion properties					
Fire load		MJ/m	0.11	0.47	
Fire propagation	on a vertical single cable		p		IEC 60332-1-2
2011/65/EC (RoHS)			compliant	compliant	

HVDC breakout cable 2.0 mm



Properties

- Metal-free indoor cable
- Low smoke, halogen free and self-extinguishing
- Aramide-free cable construction

Applications

- Installation in indoor areas
- Data cable in distribution centres
- For installation in cable ducts
- Ideal for applications involving high safety requirements in case of fire

Design

Cable design	central strength member, non metallic, 16 to 18 single-fiber cables with tight tube, separating tape
Channel marking	single-fiber cable numbered
Jacket material	LSFH™
Tube/jacket colour	black

According to IEC 60794-1-2

Ordering information

16-.../FSNH-...20
16-.../VSNH-...20
18-.../FSNH-...20
18-.../VSNH-...20

Specification		16	16	18	18	
CPR main class	mm	12.0	12.0	13.0	13.0	
Single-fiber cable Ø	mm	2.0	2.0	2.0	2.0	
Tube Ø	mm	0.9	0.5	0.9	0.5	numbered
Approx. weight	kg/km	138	138	162	162	
Fiber type		E9, G50, G62	H200	E9, G50, G62	H200	

Mechanical properties							
Tensile strength	during installation	N	700	700	1000	1000	IEC 60794-1-2 E1
	in service	N	16 × 15	16 × 15	18 × 15	18 × 15	
Min. bend radius	during installation	mm	180	180	200	200	IEC 60794-1-2 E11
	in service	mm	120	120	160	160	
Crush resistance	short-term	N/dm	10 000	10 000	10 000	10 000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	2000	2000	
Repeated bending	R=120mm, m=4.5kg	cycles	1000	1000			IEC 60794-1-21 E6
	R=150mm, m=2.0kg	cycles	1000				
Kink resistance	R=20mm		p	p			IEC 60794-1-21 E10
Flexing	R=240mm	cycles	100	100			IEC 60794-1-21 E8
Coiling capability	l=100m, R=120mm	cycles	5	5			HUBER+SUHNER
Impact resistance	Wp=1J, r=25mm	impacts	10	10	10	10	IEC 60794-1-21 E4
Torsion	±180°, l=1000mm, m=4kg	cycles	10	10			IEC 60794-1-21 E4

Thermal properties				
Temperature range	during installation	°C	-25 to +70	IEC 60794-1-22 F12
	in service	°C	-25 to +85	
	in storage	°C	-45 to +85	

Combustion properties							
Fire load		MJ/m	3.4	3.4	3.7	3.7	
Fire propagation	on a vertical single cable		p	p	p	p	IEC 60332-1-2
Halogen acid gas	Jacket material		p	p	p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant				

p = passed

Mobile field cable with flexible loose tube jelly-filled – up to 12 fibers



Properties

- For direct connector assembly
- Strain relief with aramide yarn
- UV-protected, suitable for outdoor use
- Metal-free
- High abrasive resistance

Applications

- Data cabling for harsh environment
- Military tactical field use
- Field video broadcast

Design

Cable design	Loose tube cable with flexible loose tube, jelly-filled, with 2 to 12 fibers
Strain relief	Aramide yarn
Fiber colour	According to colour code
Jacket material	TPU
Jacket colour	black

According to IEC 60794-1-2

Ordering information

12-.../EW(ZN)Z-...60	A-BQ(ZN)11Y - 1 x U/125
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Please see page 193.

Specification			
Jacket Ø	mm	6.0	
No. of fibers		2 to 12	
Loose tube		Flex	
Approx. weight	kg/km	26	
Fiber type		E9 , G50	

Mechanical properties				
Tensile strength	during installation	N	4000	IEC 60794-1-21 E1
	in service	N	2000	
Min. bend radius	during installation	mm	60	IEC 60794-1-2 E11
	in service	mm	60	
Crush resistance	short-term	N/dm	10 000	IEC 60794-1-2 E3
	long-term	N/dm	2000	
Repeated bending	R=25mm, m=5kg	cycles	20 000	IEC 60794-1-21 E6
Flexing	R=120mm, m=1kg	cycles	100 000	IEC 60794-1-21 E8
Coiling capability	l=100m, R=80mm	cycles	5	HUBER+SUHNER
Impact resistance	Wp=2.21J	impacts	20	IEC 60794-1-21 E4
Torsion	±360°, l=1000mm	cycles	100 000	IEC 60794-1-21 E4

Thermal properties				
Temperature range	during installation	°C	-25 to +85	IEC 60794-1-22 F1
	in service	°C	-45 to +85	
	in storage	°C	-60 to +85	

Combustion properties			
Fire load	MJ/m	3.4	
2011/65/EC (RoHS)		compliant	

p = passed

Mobile field cables



Properties

- High tensile strength
- For direct connector assembly
- Excellent coiling capability
- High chemical resistance against acids and alkalis
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Improved crush resistance
- UV-protected, suitable for outdoor use
- Metal-free
- Easy stripping
- High tensile strength, high abrasion and cut resistance

Applications

- Fixed or mobile data cabling (MASTERLINE mobile)
- Data cabling for harsh environment
- Military tactical field use
- Field video broadcast
- Machine cabling, drag chains

Design

Cable design	2, 4, 8 and 12 tight tubes
Strain relief	aramide yarn
Jacket material	TPU
Jacket colour	black

According to IEC 60794-1-2

Ordering information

02-.../FSN(ZN)Z-...56	AT-V(ZN)11Y 2...
04-.../FSN(ZN)Z-...56	AT-V(ZN)11Y 4...
08-.../FSN(ZN)Z-...68	AT-V(ZN)11Y 8...
12-.../FSN(ZN)Z-...80	AT-V(ZN)11Y 12...

Please see page 193.

Specification							
Number of Fiber			2	4	8	12	
Jacket Ø	mm		5.6	5.6	6.8	8.0	
Tube Ø	mm		0.9	0.9	0.9	0.9	coloured
Approx. weight	kg/km		24	26	40	53	

Mechanical properties								
Tensile strength	during installation		N	4000	4000	4000	4000	IEC 60794-1-2 E1
	in service		N	2000	2000	2000	2000	
Min. bend radius	during installation		mm	90	90	90	120	IEC 60794-1-2 E11
	in service		mm	45	45	45	80	
Crush resistance	short-term	E9 G50	N/dm	21 000 19 000	21 000 19 000	21 000 19 000	10 000 10 000	IEC 60794-1-2 E3
	long-term	E9 G50	N/dm	6000 8000	6000 8000	6000 2000	2000 2000	
Repeated bending	r = 50 mm, weight = 2 kg r = 80 mm, weight = 5 kg		cycles	20 000	20 000	20 000	20 000	IEC 60794-1-2 E6
Flexing	r = 100 mm, weight = 1 kg r = 120 mm, weight = 2 kg r = 80 mm, weight = 1.5 kg		cycles	100 000	100 000	100 000	100 000	IEC 60794-1-2 E8
Impact resistance	Wp = 2.21 J		im- pacts	300	300	300	300	IEC 60794-1-2 E4
Coiling capability	length = 500 m/r = 45 mm length = 500 m/r = 80 mm length = 100 m/r = 80 mm		cycles	5	5	5	5	HUBER+SUHNER
Torsion	± 1440°, l = 1000 mm ± 360°, l = 1000 mm		cycles	1000	1000	1000	1000	IEC 60794-1-2 F5B IEC 60794- 1-2 E7

Thermal properties				
Temperature range	during installation	°C	−45 to +85	IEC 60794-1-22 F1
	in service	°C	−60 to +85	
	in storage	°C	−60 to +85	

Combustion properties							
Fire load	MJ/m	0.5	0.5	0.75	0.7		
2011/65/EC (RoHS)			compliant				

p = passed

Glass-armoured riser cables – 2 fibers



Properties

- Metal-free indoor and outdoor cable
- Rodent-protected, glass-armoured
- For vertical applications
- For direct connector assembly
- Halogen-free and self-extinguishing
- Low fire load for high safety requirements
- Longitudinal and transversal watertight cable

Applications

- For FTTA installation
- Data cable in distribution networks

Design

Cable design	2 tight tubes
Strain relief and rodent protection	glass-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

02-.../F(ZNG)H-...48	UT-V(ZN)BH 2...
02-.../F(ZNG)H-...55	UT-V(ZN)BH 2...
02-.../F(ZNG)H-...70	UT-V(ZN)BH 2...

Please see page 193.

Approvals

UL listed acc. OFNR

Specification						
CPR main class			Dca	Dca	Dca	
Number of Fiber			2	2	2	
Jacket Ø	mm		4.8	5.5	7.0	
Tube Ø	mm		0.9	0.9	0.9	coloured
Approx. weight	kg/km		26	35	55	

Mechanical properties						
Tensile strength	during installation	N	1000	1000	1000	IEC 60794-1-2 E1
	in service	N	500	500	500	
Min. bend radius ¹⁾	during installation	mm	72	83	105	IEC 60794-1-2 E11
	in service	mm	48	60	70	
Crush resistance Single-mode	short-term	N/dm	20 000	20 000	20 000	IEC 60794-1-2 E3
	long-term	N/dm	6000	6000	6000	
Crush resistance Multimode	short-term	N/dm	20 000	20 000	20 000	IEC 60794-1-2 E3
	long-term	N/dm	7500	6000	6000	
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	p	IEC 60794-1-2 F5B

Thermal properties						
Temperature range	during installation	°C	-40 to +70	-25 to +75	-25 to +75	IEC 60794-1-22 F1
	in service	°C	-40 to +75	-40 to +75	-40 to +75	
	in storage	°C	-40 to +75	-40 to +75	-40 to +75	

Combustion properties						
Fire load		MJ/m	0.46	0.67	1.2	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
	on a vertical cable bundle		p	p	p	IEC 60332-3-25
	on a vertical cable bundle		p	p	p	UL 1666
Halogen acid gas	Jacket material		p	p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	p	IEC 60754-2
2011/65/EC (RoHS)			compliant			
(EU) No 305/2011 (CPR)			Dca-s2,d0,a1	Dca-s1a,d0,a1	Dca-s1a,d1,a1	EN 50575
Hazard level 3					compliant	EN 45545

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimized.

Glass-armoured riser cables – 4 fibers



Properties

- Metal-free indoor and outdoor cable
- Rodent-protected, glass-armoured
- Ripcord for easy jacked removal
- For direct connector assembly
- Low smoke, halogen-free and self-extinguishing
- Low fire load for high safety requirements
- Longitudinal and transversal watertight cable

Applications

- For FTTA installation
- Data cable in distribution networks

Design

Cable design	central strength member (non metallic) 4 tight tubes 1 ripcord
Strain relief and rodent protection	glass-armoured
Jacket material	LSFH™
Jacket colour	black

According to IEC 60794-1-2

Ordering information

04-.../FSN(ZNG)H-...55	UT-V(ZN)BH 4...
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Please see page 194.

Specification					
Fiber types		E9	G50, G62		
Number of Fiber		4	4		
Jacket Ø	mm	5.5	5.5		
Tube Ø	mm	0.9	0.9	coloured	
Approx. weight	kg/km	33	33		

Mechanical properties					
Tensile strength	during installation	N	1000	1000	IEC 60794-1-2 E1
	in service	N	500	500	
Min. bend radius ¹⁾	during installation	mm	83	83	IEC 60794-1-2 E11
	in service	mm	60	60	
Crush resistance	short-term	N/dm	20 000	6000	IEC 60794-1-2 E3
	long-term	N/dm	3000	2000	
Impact resistance	Wp = 1.53 J	impacts	100	200	IEC 60794-1-2 E4
Repeated bending	r = 40 mm, weight = 1 kg	cycles	10 000	10 000	IEC 60794-1-2 E6
Flexing	r = 100 mm, weight = 1.5 kg	cycles	20 000	20 000	IEC 60794-1-2 E8
Torsion	± 360°, l = 1000 mm	cycles	1000	1000	IEC 60794-1-2 E7
Water penetration	h = 1 m, 24 h, p < 3 m		p	p	IEC 60794-1-2 F5B

Thermal properties					
Temperature range	during installation	°C	-25 to +75	-25 to +75	IEC 60794-1-22 F1
	in service	°C	-40 to +75	-40 to +75	
	in storage	°C	-40 to +75	-40 to +75	

Combustion properties					
Fire load		MJ/m	0.7	0.7	
Fire propagation	on a vertical single cable		P	P	IEC 60332-1-2
	on a vertical cable bundle		P	P	IEC 60332-3-24
	on a vertical cable bundle		P	P	UL 1666
Halogen acid gas	Jacket material		P	P	IEC 60754-1
Degree of acidity	Jacket material		P	P	IEC 60754-2
2011/65/EC (RoHS)			compliant		

p = passed

¹⁾ Smaller bending radius are possible with E9/125 LowBend (ITU G.657) and G50/125-OM3/OM4 BendOptimized.

Rugged multifiber loose tube up to 24 fibers (jelly-free)



Properties

- Metal- and jelly-free cable
- Rodent-protected, glass-armoured
- For mobile applications
- No need for cleaning the fibers
- Longitudinal and transversal watertight cable

Applications

- Fixed or mobile data cabling
- Data cabling for harsh environment
- Machine cabling, drag chains

Design

Cable design	dry multifiber loose tube with 2 up to 24 fibers
Strain relief and rodent protection	glass-roving
Jacket material	TPU
Jacket colour	black

According to IEC 60794-1-2

Ordering information

24-.../Q(ZNG)Z-...70	A-BQ(ZN)B11Y 1 x .../125
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Please see page 194.

Specification				
Number of Fiber	mm	2 to 24		
Jacket Ø	mm	7.0		
Tube Ø	mm	2.8		coloured
Approx. weight	kg/km	44		

Mechanical properties					
Tensile strength	during installation	N	2500		IEC 60794-1-2 E1
	in service	N	1500		
Min. bend radius	during installation	mm	50		IEC 60794-1-2 E11
	in service	mm	70		
Crush resistance	short-term	N/dm	9000		IEC 60794-1-2 E3
	long-term	N/dm	2000		
Impact resistance	Wp = 1.5 J	impacts	100		IEC 60794-1-2 E4
Repeated bending	r = 50 mm, weight = 2 kg	cycles	10 000		IEC 60794-1-2 E6
Flexing	r = 120 mm velocity = 1.4 m/s	cycles	100 000		IEC 60794-1-2 E8
Water penetration	h = 1 m, 24 h, p < 3 m		b		IEC 60794-1-2 F5B

Thermal properties					
Temperature range	during installation	°C	-25 to +70		IEC 60794-1-22 F1
	in service	°C	-45 to +85		
	in storage	°C	-45 to +85		

Combustion properties				
Fire load	MJ/m	0.58		
2011/65/EC (RoHS)		compliant		

RADOX[®] glass-armoured multifiber loose tube cables



Properties

- Metal-free rodent-protected indoor and outdoor cable
- High flexibility and form stability
- UV and ozone resistance
- High abrasion and soldering iron resistance
- Halogen-free cable with improved behaviour in case of fire
- Meets requirements for circuit integrity in case of fire
- Best oil and fluid resistance

Applications

- Ideal for applications involving safety requirements in case of fire
- Rolling stock in railway
- Oil and gas platforms

Design

Cable design	multifiber loose tube up to 24 fibers, jelly-filled RADOX [®] cable
Strain relief	glass-rovings
Jacket material	RADOX [®]
Jacket colour	black

According to IEC 60794-1-2

Ordering information

24-.../W(ZNG)R-...85	U-DQ(ZN)BR 1 x n/125
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Please see page 194.

Specification				
CPR Main class			Cca	
Jacket Ø			8.5	
Number of Fiber			2 to 24	
Approx. weight	kg/km		88	

Mechanical properties				
Tensile strength	during installation	N	3000	IEC 60794-1-2 E1
	in service	N	1500	
Min. bend radius	during installation	mm	130	IEC 60794-1-2 E11
	in service	mm	80	
Crush resistance	short-term	N/dm	10 000	IEC 60794-1-2 E3
	long-term	N/dm	2500	
Impact resistance	Wp = 4.41 J	impacts	15	IEC 60794-1-2 E4
Water penetration	h = 1 m, 24 h, p < 3 m		p	IEC 60794-1-2 F5B

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-60 to +85	
	in storage	°C	-60 to +85	

Combustion properties				
Fire load		MJ/m	1	
Fire propagation	on a vertical single cable		p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	IEC 60332-3-25
Fire test	with circuit integrity (CI)	min.	180	IEC 60331-25
Smoke density			p	IEC 61034-2
Halogen acid gas	Jacket material		p	IEC 60754-1
Degree of acidity	Jacket material		p	IEC 60754-2
2011/65/EC (RoHS)			compliant	
EU No 305/2011 (CPR)			Cca-s1a, d0, a1	EN 50575
Hazard level 3			compliant	EN 45545

p = passed

RADOX®

- Meets LSFH properties.
- RADOX® jacket material compliant to EM 104 specification of EN 50264-1 for railway rolling stock application.
- Fully compliant to CEN/TS 45545-2 for fire safety in railway applications.
- Meets the increased requirements of SHF2 (SHF Mud) and fulfills flame, fire, oil and mud resistance acc. NEK 606.
- NEK 606 standard for offshore oil and gas, ship and marine applications.
- Application acc. NEK 606: outdoor cable for emergency systems – operational during fire.

Steel armoured multifiber loose tube cable



Properties

- Steel armoured indoor and outdoor cable
- With rodent protection (steel armoured)
- For high mechanical and thermal requirements
- Low smoke*, halogen-free and self-extinguishing
- Low fire load for high safety requirements

Applications

- For outdoor and indoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installations directly in the ground

Design

Cable design	1 to 2 multifiber loose tube, jelly-filled (RADOX®, LSFH), jelly-free (TPU) up to 24 fibers		
Strain relief	aramid yarn		
Rodent protection	steel armoured		
Jacket material	RADOX®	LSFH	TPU
Jacket colour	black		

According to IEC 60794-1-2

Ordering information

24-.../W(ZN)HAR-...82 (RADOX®)	U-DQ(ZN)H(ZS)R 1 x .../125
24-.../W(ZN)HAH-...80 (LSFH)	U-DQ(ZN)H(ZS)H 1 x .../125
24-.../Q(ZNG)HAU-...80 (TPU)	U-BQ(ZN)H(ZS)11Y 1 x .../125

Please see page 194.

* Does not apply for TPU variant.

Specification		RADOX	LSFH	TPU	
Jacket Ø	mm	8.2	8.0	8.0	
Number of Fiber		2 to 24	2 to 24	2 to 24	
Multifiber loose tube	mm	standard	standard	standard	
Approx. weight	kg/km	115	87	100	

Mechanical properties						
Tensile strength	during installation	N	3750	3000	3000	IEC 60794-1-2 E1
	in service	N	2000	1500	1500	
Min. bend radius	during installation	mm	120	120	120	IEC 60794-1-2 E11
	in service	mm	80	80	80	
Crush resistance	short-term	N/dm	8000	4000	4000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	2000	
Impact resistance	Wp = 4.5 J	impacts	50	50	50	IEC 60794-1-2 E4
Repeated bending	R=110 / weight = 2.5kg	cycles	10 000	5000		IEC 60794-1-21 E6
Kink resistance	Radius	mm	10	10		IEC 60794-1-21 E10
Torsion	± 180	cycles	70 000	500		IEC 60794-1-21 E7

Thermal properties						
Temperature range	during installation	°C	-20 to +70	-20 to +70	-20 to +70	IEC 60794-1-22 F1
	in service	°C	-50 to +85	-40 to +85	-70 to +85	
	in storage	°C	-50 to +85	-40 to +85	-70 to +85	

Combustion properties						
Fire load		MJ/m	1.25	1.5	1.1	
Fire propagation	on a vertical single cable		p	p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	p		IEC 60332-3-25
Fire propagation	on a vertical cable bundle			p		IEC 60332-3-22
Fire test	with circuit integrity (CI) min			180		IEC 60331-25
Smoke density			p	p		IEC 61034-2
Halogen acid gas	Jacket material		p	p		IEC 60754-1
Degree of acidity	Jacket material		p	p		IEC 60754-2
2011/65/EC (RoHS)			compliant	compliant	compliant	

p = passed

DNV GL Type approved multifiber loose tube cables – steel- or glass-armoured



RADOX®



LSFH™

Properties

- Steel armoured inner and outer cable
- With rodent protection (steel armoured)
- For high mechanical and thermal requirements
- Low smoke, halogen-free and self-extinguishing
- Low fire load for high safety requirements

Applications

- For outdoor and indoor installations and in mechanically unprotected environments
- Data cable in distribution networks
- For installations directly in the ground



Design

Cable design	multifiber loose tubes up to 24 fibers, jelly-filled	
Strain relief	aramid yarn/glass-roving	
Rodent protection	steel armoured	glass-roving
Jacket material	RADOX®	LSFH™
Jacket colour	black	

According to IEC 60794-1-2

Ordering information

24-.../W(ZN)HAR-...82 Certificate No. TAE 0000173	U-DQ(ZN)H(ZS)R 1 x .../125
24-.../W(ZNG)H-...120 Certificate No. TAE 0000172	U-DQ(ZN)BH 1 x .../125

Please see page 194, 195.

Approvals

DNV GL Type approved
 Certificate no.:
 TAE 0000173
 TAE 0000172

Specification		Steel armoured	Glass armoured	
Jacket Ø	mm	8.2	12.0	
Number of Fiber		2 – 24	2 – 24	
Multifiber loose tube	mm	standard	standard	
Approx. weight	kg/km	115	178	

Mechanical properties					
Tensile strength	during installation	N	3750	9000	IEC 60794-1-2 E1
	in service	N	2000	4500	
Min. bend radius	during installation	mm	120	180	IEC 60794-1-2 E11
	in service	mm	80	120	
Crush resistance	5 min	N/dm	2000	6000	IEC 60794-1-2 E3
Cold bending radius	T= –25°C	mm		120	
Impact resistance	Wp = 5 J	impacts	1	1	IEC 60794-1-21 E4
Repeated bending	R=100 / weighth = 10kg	cycles		500	IEC 60794-1-21 E6
Torsion	± 180	cycles	20	20	IEC 60794-1-21 E7

Thermal properties					
Temperature range	during installation	°C	–20 to +70	–10 to +50	IEC 60794-1-22 F1
	in service	°C	–50 to +85	–40 to +70	
	in storage	°C	–50 to +85	–40 to +70	

Combustion properties					
Fire load		MJ/m	1.7	3.1	
Fire propagation	on a vertical single cable		p	p	IEC 60332-1-2
Fire propagation	on a vertical cable bundle		p	p	IEC 60332-3-24
Fire test	with circuit integrity (CI)	min.		180 180	IEC 60331-25 EN50200
Smoke density			p	p	IEC 61034-2
Halogen acid gas	Jacket material		p	p	IEC 60754-1
Degree of acidity	Jacket material		p	p	IEC 60754-2
Oil resistance	IRM902		168h; 100 °C	8h; 70 °C	IEC 60092-360
Drilling fluid resistance	IRM903		168h; 100 °C		IEC 60092-360
Drilling fluid resistance	CaBr2		56d; 70 °C		IEC60092-360
2011/65/EC (RoHS)			compliant		

p = passed

Drag chain cables



Properties

- Strain relieved with aramide yarn
- For direct connector assembly
- High chemical resistance against acids and alkalis
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Improved crush resistance
- Metal-free

Applications

- Medium to large drag chains
- Cabling in industrial applications
- As control or data cable in industry robots, cranes, production lines and automation systems
- Cable design allows for a permanent load with more than one million drag chain cycles

Design

Cable design	up to 12 tight tubes strength member
Strain relief and rodent protection	aramide yarn
Jacket material	TPU (optional TPU flame retardant)
Jacket colour	black

According to IEC 60794-1-2

Ordering information

12-.../FSN(ZN)YZ-...130	AT-V(ZN)2Y11Y 12.../125
12-.../FSN(ZN)YU-...130 (Flame retardant outer jacket)	AT-V(ZN)2Y11Y 12.../125

Please see page 195.

Specification					
Fiber types	mm	E9	G50, G62.5		
Jacket Ø	mm	13	13		
Tube Ø	mm	0.9	0.9		coloured
Approx. weight	kg/km	128	128		

Mechanical properties					
Tensile strength	during installation	N	4000	4000	IEC 60794-1-2 E1
	in service	N	2000	2000	
Min. bend radius	during installation	mm	200	200	IEC 60794-1-2 E11
	in service	mm	100	100	
Crush resistance	short-term	N/dm	4000	4000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	
Repeated bending	r = 100 mm, weight = 5 kg	cycles	5000	5000	IEC 60794-1-2 E6
Flexing	r = 120 mm velocity = 0.5 m/s L = 2.0 m	cycles	100 000	100 000	IEC 60794-1-2 E8
Flexing	r = 100 mm velocity = 2 m/s L = 2.0 m	cycles	1 000 000	1 000 000	HUBER+SUHNER drag chain test

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-40 to +85	-30 to +85	
	in storage	°C	-40 to +85	-40 to +85	

Combustion properties					
Fire load		MJ/m	3.49		
Fire propagation	on a vertical single cable		p*		IEC 60332-1-2
2011/65/EC (RoHS)			compliant		

p = passed

* only with TPU flame retardant outer jacket

RADOX® drag chain cable



Properties

- Strain relieved with aramide yarn
- For direct connector assembly
- High chemical resistance against acids and alkalis
- For high mechanical and thermal stability
- Halogen-free and non-corrosive fire gases
- Improved crush resistance
- Metal-free
- Weld bead resistant cable outer jacket

Applications

- Medium to large drag chains
- Cabling in industrial applications
- As control or data cable in industry robots, cranes, production lines and automation systems
- Cable design allows for a permanent load with more than one million drag chain cycles

Design

Cable design	up to 12 tight tubes strength member
Strain relief and rodent protection	aramide yarn
Jacket material	RADOX®
Jacket colour	black

According to IEC 60794-1-2

Ordering information

12-.../FSN(ZN)YR-...130	AT-V(ZN)2YR 12.../125
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Please see page 195.

Specification			
Fiber types	mm	E9.G50	
Jacket Ø	mm	13	
Tube Ø	mm	0.9	coloured
Approx. weight	kg/km	160	

Mechanical properties				
Tensile strength	during installation	N	4000	IEC 60794-1-2 E1
	in service	N	2000	
Min. bend radius	during installation	mm	200	IEC 60794-1-2 E11
	in service	mm	100	
Crush resistance	short-term	N/dm	15 000	IEC 60794-1-2 E3
	long-term	N/dm	5000	
Repeated bending	r = 100 mm, weight = 5 kg	cycles	5000	IEC 60794-1-2 E6
Flexing	r = 120 mm velocity = 0.5 m/s L = 2.0 m	cycles	25 000	IEC 60794-1-2 E8

Thermal properties				
Temperature range	during installation	°C	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-30 to +85	
	in storage	°C	-40 to +85	

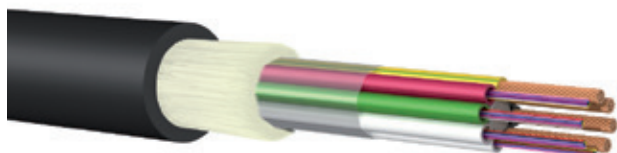
Combustion properties			
Fire load	MJ/m	4.6	
Fire propagation		p	IEC 60332-1-2
2011/65/EC (RoHS)		compliant	

p = passed

Hybrid cables



Hybrid breakout cable



Hybrid multifiber loose tube cable

Properties

- Custom designed cable configuration
- Each fiber strain relieved
- High chemical resistance against acids and alkalies
- Tube can be stripped up to 2 m in one piece
- For high mechanical requirements
- Low smoke, halogen-free and self extinguishing
- Hybrid multifiber loose tube cables are rodent protected (glass-armoured)

Applications

- As data and power cable for industry, LAN, video, telephone or customer-specific applications
- Installation outdoors, in moist, wet cable ducts
- With LSFH™ jacket ideal for applications involving high safety requirements in case of a fire (installation indoors)

Design of hybrid breakout cables

Cable design	single-fiber semi-tight tubes, orange, numbered
Conductor	1.5 mm ² up to 4 conductors
Strain relief	aramide yarn
Jacket material	LSFH™
Jacket colour	black

Design of hybrid multifiber loose tube cables

Cable design	multifiber loose tubes
Conductor	1.5 mm ² up to 4 conductors 2.5 mm ² up to 4 conductors
Strain relief	glass armoured
Jacket material	PE (optional LSFH™)
Jacket colour	black

According to IEC 60794-1-2

Ordering information

Hybrid breakout cables 04-.../CWJSN(ZN)H-...27+...-C15 08-.../CWJSN(ZN)H-...27+...-C15	IT-W(ZN)HH 4...+...x1.5 IT-W(ZN)HH 8...+...x1.5
Hybrid multi-fiber loose tube cables, PE jacket/LSFH™ to 60-.../WSN(ZNG)-...150+...-C... to 96-.../WSN(ZNG)-...180+...-C.	A-DQ(ZN)B2Y 5 x .../125 + ...x... A-DQ(ZN)B2Y 8 x .../125 + ...x...

Hybrid cable order on request.

Specification fiber optic components						
		4-way breakout	8-way breakout	5-way multifiber loose tube	8-way multifiber loose tube	
Jacket Ø	mm	10.0	13.0	15.0	18.0	
Single-fiber cable Ø/multifiber loose tube Ø	mm	2.7	2.7	2.8	2.8	
Channel marking on single-fiber		numbered		coloured		

Specification conductor							
Outer Ø conductor ¹⁾	1.5 mm ² 2.5 mm ²	mm mm	2.7	2.7	2.7 3.5	2.7 3.5	
Rated voltage U ₀ /U	1.5 mm ² 2.5 mm ²	V V	600/1000 600/1000				
Electrical resistance	1.5 mm ² 2.5 mm ²	Ω/km	13.7	13.7	13.7 8.2	13.7 8.2	
Jacket material		RADOX 125, halogen-free					

Mechanical properties							
Tensile strength	during installation	N	2000	4000	9000	13000	IEC 60794-1-2 E1
	in service	N	1000	2000	4500	6500	
Min. bend radius	during installation	mm	150	200	225	270	IEC 60794-1-2 E11
	in service	mm	100	130	150	180	
Crush resistance	short-term	N/dm	10 000	10 000	8000	8000	IEC 60794-1-2 E3
	long-term	N/dm	2000	2000	3000	3000	
Impact resistance	r = 25 mm Wp = 2.21 J Up = 4.41 J	impacts	50	50	100	100	IEC 60794-1-2 E4
					100	100	

Thermal properties					
Temperature range	during installation	°C	-10 to +50	-10 to +50	IEC 60794-1-22 F1
	in service	°C	-20 to +70	-40 to +70	
	in storage	°C	-25 to +70	-40 to +70	

Combustion properties					
Fire propagation	p	p	p ²⁾	p ²⁾	IEC 60332-1
2011/65/EC (RoHS)	compliant				

p = passed

Other hybrid cable types available upon request.

¹⁾ Customer-specific order of colours for conductors. Available colours are black, red, white, blue, yellow/green

²⁾ Only applies to LSFH™, PE jacket material 'not passed'

Order information for indoor cables

Semi-tight tubes 0.9 mm

available as standard only: 2000 m



Item no.	Cable type	Description
22521983	01-E9/CH-E9-FE	semi-tight tube Ø 0.9 mm, 1 x 9/125 µm G.652.D, tube and fiber color yellow
84065234	01-E9A2/CH-E9-FG	semi-tight tube Ø 0.9 mm, 1 x 9/125 µm G.652.D/G.657.A1, tube yellow and fiber color black
22520626	01-G50/CH-D9-FD	semi-tight tube Ø 0.9 mm, 1 x G50/125 µm OM2, tube and fiber color orange
85010138	01-G50/CH-M9-F-FM	semi-tight tube Ø 0.9 mm, 1 x G50/125 µm OM3, tube and fiber color turquoise
84121373	01-G50/CH-L9-G-FL	semi-tight tube Ø 0.9 mm, 1 x G50/125 µm OM4, tube and fiber color heather violet
22520967	01-G62/CH-C9-FC	semi-tight tube Ø 0.9 mm, 1 x G62.5/125 µm OM1, tube and fiber color blue

On request: up to 12 different colours for all different fiber types available; up to 24 different colours with ring marking for all different fiber types available.

Tight tubes 0.9 mm

available as standard only: 2000 m



Item no.	Cable type	Description
22521478	01-E9/F-E9	tight tube Ø 0.9 mm, 1 x 9/125 µm G.652.D/G.657.A1, yellow
23012983	01-E9/F-F9	tight tube Ø 0.9 mm, 1 x 9/125 µm G.652.D/G.657.A1, white
84145050	01-E9A2/F-E9-FG	tight tube Ø 0.9 mm, 1 x 9/125 µm G.657.A2, yellow
85001241	01-E9A2/F-F9	tight tube Ø 0.9 mm, 1 x 9/125 µm G.657.A2, white
22521479	01-G50/F-D9	tight tube Ø 0.9 mm, 1 x 50/125 µm OM2, orange
22523050	01-G62/F-C9	tight tube Ø 0.9 mm, 1 x 62.5/125 µm OM1, blue

Tight tubes 0.6 mm

available as standard only: 2000 m



Item no.	Cable type	Description
84077172	01-E9A2/V-T6-FA	tight tube Ø 0.6 mm, 1 x 9/125 µm G.657.A2, yellow
84077173	01-E9A2/V-T6-FB	tight tube Ø 0.6 mm, 1 x 9/125 µm G.657.A2, red
84077174	01-E9A2/V-T6-FE	tight tube Ø 0.9 mm, 1 x 9/125 µm G.657.A2, yellow
84077175	01-E9A2/V-T6-FC	tight tube Ø 0.6 mm, 1 x 9/125 µm G.657.A2, blue

Simplex cables 1.4 mm

LSFH™ jacket with tight tube 0.6 mm



Item no.	Cable type	Description
84099204	01-E9A2/VJH-E14-FG	simplex cable Ø 1.4 mm, 1 x 9/125 µm G.657.A2, tight tube 0.6 mm, LSFH yellow
84093690	01-G50/VJH-M14-F	simplex cable Ø 1.4 mm, 1 x 50/125 µm OM3, tight tube 0.6 mm, LSFH turquoise
tbd	01-G50/VJH-L14-G	simplex cable Ø 1.4 mm, 1 x 50/125 µm OM4, tight tube 0.6 mm, LSFH heather violet

Simplex cables 1.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
85020782	01-E9/CWJH-E17#D	simplex cable Ø 1.7 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84078975	01-E9A2/CWJH-E17-FG#D	simplex cable Ø 1.7 mm, 1 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow

Simplex cables 2.0 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
84012397	01-E9/CWJH-E20#D	simplex cable Ø 2.0 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84044941	01-E9/CWJH-C20#D	simplex cable Ø 2.0 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH blue
84065255	01-E9A2/CWJH-E20-FG#D	simplex cable Ø 2.0 mm, 1 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
84000564	01-G50/CWJH-D20#D	simplex cable Ø 2.0 mm, 1 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84033249	01-G50/CWJH-M20-F#D	simplex cable Ø 2.0 mm, 1 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121677	01-G50/CWJH-L20-G#D	simplex cable Ø 2.0 mm, 1 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84000565	01-G62/CWJH-D20#D	simplex cable Ø 2.0 mm, 1 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Simplex cables 2.4 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
85020593	01-E9/CWJH-E24#D	simplex cable Ø 2.4 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84003837	01-G50/CWJH-D24#D	simplex cable Ø 2.4 mm, 1 x 50/125 OM2, semi tight tube 0.9 mm, LSFH orange

Simplex cables 2.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
22523125	01-E9/CWJH-E27#D	simplex cable Ø 2.7 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84086802	01-E9A2/CWJH-E27-FG#D	simplex cable Ø 2.7 mm, 1 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
22523126	01-G50/CWJH-D27#D	simplex cable Ø 2.7 mm, 1 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
22523127	01-G62/CWJH-D27#D	simplex cable Ø 2.7 mm, 1 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Simplex cables according DTAG specification

LSFH™ jacket with semi-tight tube



Item no.	Cable type	Description
t.b.d.	01-E9/CHJH-E19	simplex cable Ø 1.9 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
85024190	01-E9/CHJH-E24	simplex cable Ø 2.4 mm, 1 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow

Order information for indoor cables

Duplex cable figure 8 – 1.4 mm

LSFH™ jacket with tight tube 0.6 mm



Item no.	Cable type	Description
84065738	02-E9/VJH-E14	duplex cable figure 8 Ø 1.4 x 3.0 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.6 mm, LSFH yellow
84126462	02-E9A2/VJH-E14-FG	duplex cable figure 8 Ø 1.4 x 3.0 mm, 2 x 9/125 µm G.657.A2, tight tube 0.6mm, LSFH yellow
84145087	02-G50/VJH-M14-F	duplex cable figure 8 Ø 1.4 x 3.0 mm, 2 x 50/125 µm OM3, tight tube 0.6mm, LSFH turquoise
84146528	02-G50/VJH-L14-G	duplex cable figure 8 Ø 1.4 x 3.0 mm, 2 x 50/125 µm OM4, tight tube 0.6mm, LSFH heather violet

Duplex cable figure 8 – 1.7 mm

LSFH™ jacket with tight tube 0.9 mm



Item no.	Cable type	Description
23040758	02-E9/FJH-E17	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH yellow
84127588	02-E9A2/FJH-E17-FG	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 9/125 µm G.657.A2, tight tube 0.9 mm, LSFH yellow
23040759	02-G50/FJH-D17	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH orange
84005418	02-G50/FJH-M17-F	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 50/125 µm OM3, tight tube 0.9 mm, LSFH turquoise
84121679	02-G50/FJH-L17-G	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH orange
23040760	02-G62/FJH-D17	duplex cable figure, 62.5/125 µm OM1, Ø 1.7 x 3.4 mm, tight tube LSFH, orange

Duplex cable figure 8 – 1.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
85024637	02-E9/CWJH-E17#D	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
85029964	02-E9A2/CWJH-E17-FG#D	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
85030614	02-G50/CWJH-M17-F#D	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
85068795	02-G50/CWJH-L17-G#D	duplex cable figure 8 Ø 1.7 x 3.4 mm, 2 x 50/125 OM4, semi tight tube 0.9mm, LSFH heather violet

Duplex cable figure 8 – 2.0 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
84008151	02-E9/CWJH-E20#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84065256	02-E9A2/CWJH-E20-FG#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
84008152	02-G50/CWJH-D20#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84008169	02-G50/CWJH-M20-F#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121856	02-G50/CWJH-L20-G#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84008153	02-G62/CWJH-D20#D	duplex cable figure 8 Ø 2.0 x 4.1 mm, 2 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Duplex cable figure 8 – 2.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
22523202	02-E9/CWJH-E27#D	duplex cable figure 8 Ø 2.7 x 5.4 mm, 2 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
22523203	02-G50/CWJH-D27#D	duplex cable figure 8 Ø 2.7 x 5.4 mm, 2 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84005133	02-G50/CWJH-M27-F#D	duplex cable figure 8 Ø 2.7 x 5.4 mm, 2 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
22523204	02-G62/CWJH-D27#D	duplex cable figure 8 Ø 2.7 x 5.4 mm, 2 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Duplex cable figure 0 – 1.4 mm

LSFH™ jacket with tight tube 0.6 mm



Item no.	Cable type	Description
84149009	02-E9/VJH-AE14	duplex cable figure 0 Ø 2.3 x 3.7 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.6mm, LSFH yellow
84148983	02-E9A2/VJH-AE14-FG	duplex cable figure 0 Ø 2.3 x 3.7 mm, 2 x 9/125 µm G.657.A2, tight tube 0.6mm, LSFH yellow
84153026	02-G50/VJH-AM14-F	duplex cable figure 0 Ø 2.3 x 3.7 mm, 2 x 50/125 µm OM3, tight tube 0.6mm, LSFH turquoise
84153207	02-G50/VJH-AL14-G	duplex cable figure 0 Ø 2.3 x 3.7 mm, 2 x 50/125 µm OM4, tight tube 0.6mm, LSFH heather violet

Duplex cable figure 0 – 2.0 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
23039888	02-E9/CWJH-AE20#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84073839	02-E9A2/CWJH-AE20-FG#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
23039889	02-G50/CWJH-AD20#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84005553	02-G50/CWJH-AM20-F#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121859	02-G50/CWJH-AL20-G#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
23039891	02-G62/CWJH-AD20#D	duplex cable figure 0 Ø 3.4 x 5.2 mm, 2 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Duplex cable figure 0 – 2.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
22523252	02-E9/CWJH-AE27#D	duplex cable figure 0 Ø 3.5 x 6.2 mm, 2 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
22523253	02-G50/CWJH-AD27#D	duplex cable figure 0 Ø 3.5 x 6.2 mm, 2 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84005135	02-G50/CWJH-AM27-F#D	duplex cable figure 0 Ø 3.5 x 6.2 mm, 2 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
22523254	02-G62/CWJH-AD27#D	duplex cable figure 0 Ø 3.5 x 6.2 mm, 2 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Duplex cables round 2.1 mm

LSFH™ jacket with tight tube 0.6 mm for LC uniboot



Item no.	Cable type	Description
84107633	02-E9A2/V(ZN)H-E21#D	duplex round cable Ø 2.1 mm, 2 x 9/125 µm G.657.A2, tight tube 0.6 mm, LSFH yellow
84107634	02-G50/V(ZN)H-M21-F#D	duplex round cable Ø 2.1 mm, 2 x 50/125 µm OM3, tight tube 0.6 mm, LSFH turquoise
84124505	02-G50/V(ZN)H-L21-G#D	duplex round cable Ø 2.1 mm, 2 x 50/125 µm OM4, tight tube 0.6 mm, LSFH heather violet

Order information for indoor cables

Optipack 8 - 2.0 mm

Multi-fiber patch cable

LSFH™ jacket with 8 fibers for MTP®/MPO



Item no.	Cable type	Description
85072218	08-E9A2/(ZN)H-E20_TIA#D	Optipack cable Ø 2.0 mm, 8 x 9/125 µm G.657.A2, LSFH yellow, TIA fiber colour code
85072217	08-G50/(ZN)H-M20-F_TIA#D	Optipack cable Ø 2.0 mm, 8 x 50/125 µm OM3, LSFH turquoise, TIA fiber colour code
85070835	08-G50/(ZN)H-L20-G_TIA#D	Optipack cable Ø 2.0 mm, 8 x 50/125 µm OM4, LSFH heather violet, TIA fiber colour code

Optipack 12 - 2.0 mm

Multi-fiber patch cable

LSFH™ jacket with 12 fibers for MTP®/MPO



Item no.	Cable type	Description
85065690	12-E9A2/(ZN)H-E20#D	Optipack cable Ø 2.0 mm, 12 x 9/125 µm G.657.A2, LSFH yellow
85068193	12-G50/(ZN)H-M20-F#D	Optipack cable Ø 2.0 mm, 12 x 50/125 µm OM3, LSFH turquoise
85068194	12-G50/(ZN)H-L20-G#D	Optipack cable Ø 2.0 mm, 12 x 50/125 µm OM4, LSFH heather violet

Optipack 12 - 3.0 mm

Multi-fiber patch cable

LSFH™ jacket with 12 fibers for MTP®/MPO



Item no.	Cable type	Description
84138650	12-E9A2/(ZN)H-E30#D	Optipack cable Ø 3.0 mm, 12 x 9/125 µm G.657.A2, LSFH yellow
84150817	12-G50/(ZN)H-M30-F #D	Optipack cable Ø 3.0 mm, 12 x 50/125 µm OM3, LSFH turquoise
84144927	12-G50/(ZN)H-L30-G#D	Optipack cable Ø 3.0 mm, 12 x 50/125 µm OM4, LSFH heather violet

Optipack 24 - 3.0 mm

Multi-fiber patch cable

LSFH™ jacket with 12 fibers for MTP®/MPO



Item no.	Cable type	Description
85067999	24-E9A2/(ZN)H-E30#D	Optipack cable Ø 3.0 mm, 24 x 9/125 µm G.657.A2, LSFH yellow
85068195	24-G50/(ZN)H-M30-F#D	Optipack cable Ø 3.0 mm, 24 x 50/125 µm OM3, LSFH turquoise
85068196	24-G50/(ZN)H-L30-G#D	Optipack cable Ø 3.0 mm, 24 x 50/125 µm OM4, LSFH heather violet

Optipack 24 - 3.6 mm

Multi-fiber patch cable

LSFH™ jacket with 24 fibers for MTP®/MPO



Item no.	Cable type	Description
85001254	24-E9A2/(ZN)H-E36#D	Optipack cable Ø 3.6 mm, 24 x 9/125 µm G.657.A2, LSFH yellow
85001255	24-G50/(ZN)H-M36-F#D	Optipack cable Ø 3.6 mm, 24 x 50/125 µm OM3, LSFH turquoise
85001256	24-G50/(ZN)H-L36-G#D	Optipack cable Ø 3.6 mm, 24 x 50/125 µm OM4, LSFH heather violet

Optipack DJ 12 - 4.0mm

Multi-fiber patch cable

LSFH jacket with 12 fibers for MTP®/MPO



Item no.	Cable type	Description
85137705	12-E9A2/(ZN)HH-E20#B	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 9/125µm G.657A2, LSFH yellow
85137707	12-G50/(ZN)HH-M20-F#B	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 50/125µm OM3, LSFH turquoise
85137706	12-G50/(ZN)HH-L20-G#B	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 50/125µm OM4, LSFH heather violet
85140643	12-E9A2/(ZN)HH-E20#C	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 9/125µm G.657A2, LSFH yellow
85140646	12-G50/(ZN)HH-M20-F#C	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 50/125µm OM3, LSFH turquoise
85140644	12-G50/(ZN)HH-L20-G#C	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 50/125µm OM4, LSFH heather violet

Optipack DJ 24 - 4.9mm

Multi-fiber patch cable

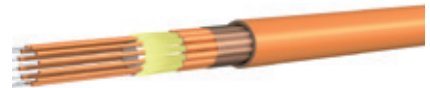
LSFH jacket with 24 fibers for MTP®/MPO



Item no.	Cable type	Description
85102544	24-E9A2/(ZN)HH-E30#B	Optipack double jacket Ø 3.0 / 4.9mm, 24 x 9/125µm G.657A2, LSFH yellow
85137704	24-G50/(ZN)HH-M30-F#B	Optipack double jacket Ø 3.0 / 4.9mm, 24 x 50/125µm OM3, LSFH turquoise
85103329	24-G50/(ZN)HH-L30-G#B	Optipack double jacket Ø 3.0 / 4.9mm, 24 x 50/125µm OM4, LSFH heather violet
85114654	24-E9A2/(ZN)HH-E30#C	Optipack double jacket Ø 3.0 / 4.9mm, 24 x 9/125µm G.657A2, LSFH yellow
85114655	24-G50/(ZN)HH-L30-G#C	Optipack double jacket Ø 3.0 / 4.9mm, 24 x 50/125µm OM4, LSFH heather violet
85140644	12-G50/(ZN)HH-L20-G#C	Optipack double jacket Ø 2.0 / 4.0mm, 12 x 50/125µm OM4, LSFH heather violet

Breakout cable – 1.4 mm

LSFH™ jacket with tight tube 0.6 mm



Item no.	Cable type	Description
84127584	12-E9/VJSNH-E14#D	breakout cable 1.4mm / Ø 9.0 mm, 12 x 9/125 µm G.652.D/G.657A1, tight tube 0.6mm, LSFH yellow
84150017	12-G50/VJSNH-M14-F#D	breakout cable 1.4mm / Ø 9.0 mm, 12 x 50/125 µm OM3, tight tube 0.6mm, LSFH turquoise
84150018	12-G50/VJSNH-L14-G#D	breakout cable 1.4mm / Ø 9.0 mm, 12 x 50/125 µm OM4, tight tube 0.6mm, LSFH heather violet
84127585	16-E9/VJSNH-E14#D	breakout cable 1.4mm / Ø 9.0 mm, 16 x 9/125 µm G.652.D/G.657A1, tight tube 0.6mm, LSFH yellow
84137530	18-E9/VJSNH-E14#D	breakout cable 1.4mm / Ø 9.5mm, 18 x 9/125 µm G.652.D/G.657A1, tight tube 0.6mm, LSFH yellow
84127586	24-E9/VJSNH-E14#C	breakout cable 1.4mm / Ø 10.6mm, 24 x 9/125 µm G.652.D/G.657A1, tight tube 0.6mm, LSFH yellow
84144533	24-E9A2/VJSNH-E14#C	breakout cable 1.4mm / Ø 10.6mm, 24 x 9/125 µm G.657A2, tight tube 0.6mm, LSFH yellow
84138289	24-G50/VJSNH-M14-F#C	breakout cable 1.4mm / Ø 10.6mm, 24 x 50/125 µm OM3, tight tube 0.6mm, LSFH turquoise
84135616	24-G50/VJSNH-L14-G#D	breakout cable 1.4mm / Ø 10.6mm, 24 x 50/125 µm OM4, tight tube 0.6mm, LSFH heather violet

Order information for indoor cables

Breakout cable – 2.0 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
84008843	04-E9/CWJSNH-E20#D	breakout cable 2.0 mm / Ø 7.0 mm, 4 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84008846	04-G50/CWJSNH-D20#D	breakout cable 2.0 mm / Ø 7.0 mm, 4 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84033250	04-G50/CWJSNH-M20-F#D	breakout cable 2.0 mm / Ø 7.0 mm, 4 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121850	04-G50/CWJSNH-L20-G#D	breakout cable 2.0 mm / Ø 7.0 mm, 4 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84008847	04-G62/CWJSNH-D20#D	breakout cable 2.0 mm / Ø 7.0 mm, 4 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange
84009199	08-E9/CWJSNH-E20#C	breakout cable 2.0 mm / Ø 9.0 mm, 8 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84009200	08-G50/CWJSNH-D20#C	breakout cable 2.0 mm / Ø 9.0 mm, 8 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84033251	08-G50/CWJSNH-M20-F#C	breakout cable 2.0 mm / Ø 9.0 mm, 8 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121854	08-G50/CWJSNH-L20-G#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
84009201	08-G62/CWJSNH-D20#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84009443	12-E9/CWJSNH-E20#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84073652	12-E9A2/CWJSNH-E20-FG#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH yellow
84009444	12-G50/CWJSNH-D20#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84033252	12-G50/CWJSNH-M20-F#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 50/125 µm OM3, semi tight tube 0.9 mm, LSFH turquoise
84121855	12-G50/CWJSNH-L20-G#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84009445	12-G62/CWJSNH-D20#C	breakout cable 2.0 mm / Ø 12.0 mm, 12 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange
85063202	24-E9/CWJSNH-E20#C	breakout cable 2.0 mm / Ø 14.0 mm, 24 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow

Breakout cable – fire resistance – 2.0 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
84018102	04-E9/CWJSNHIH-E20	Fire resistant breakout cable 2.0 mm / Ø 10.0 mm, 4 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84018103	04-G50/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 10.0 mm, 4 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84150417	04-G50/CWJSNHIH-L20-G	Fire resistant breakout cable 2.0 mm / Ø 10.0 mm, 4 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84018104	04-G62/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 10.0 mm, 4 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange
84018106	08-E9/CWJSNHIH-E20	Fire resistant breakout cable 2.0 mm / Ø 12.0 mm, 8 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84018107	08-G50/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 12.0 mm, 8 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
85001062	08-G50/CWJSNHIH-L20-G	Fire resistant breakout cable 2.0 mm / Ø 12.0 mm, 8 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84018108	08-G62/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 12.0 mm, 8 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange
84018109	12-E9/CWJSNHIH-E20	Fire resistant breakout cable 2.0 mm / Ø 15.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, semi tight tube 0.9 mm, LSFH yellow
84018110	12-G50/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 15.0 mm, 12 x 50/125 µm OM2, semi tight tube 0.9 mm, LSFH orange
84150427	12-G50/CWJSNHIH-L20-G	Fire resistant breakout cable 2.0 mm / Ø 15.0 mm, 12 x 50/125 µm OM4, semi tight tube 0.9 mm, LSFH heather violet
84018111	12-G62/CWJSNHIH-D20	Fire resistant breakout cable 2.0 mm / Ø 15.0 mm, 12 x 62.5/125 µm OM1, semi tight tube 0.9 mm, LSFH orange

Optipack 8 – breakout – 2.0 mm up to 96 fibers

Multifiber breakout cable

LSFH™ jacket with 8 fibers for MTP®/MPO



Item no.	Cable type	Description
85092255	24-8E9A2/(ZN)SNH-E20_TIA#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 24 x 9/125µm G.657.A2, LSFH yellow, TIA fiber colour code
85095525	24-8G50/(ZN)SNH-L20-G_TIA#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 24 x 50/125µm OM4, LSFH heather violet, TIA fiber colour code
85096626	48-8E9A2/(ZN)SNH-E20_TIA#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 48 x 9/125µm G.657.A2, LSFH yellow, TIA fiber colour code
85080353	48-8G50/(ZN)SNH-M20-F_TIA#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 48 x 50/125µm OM3, LSFH turquoise, TIA fiber colour code
85096624	48-8G50/(ZN)SNH-L20-G_TIA#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 48 x 50/125µm OM4, LSFH heather violet, TIA fiber colour code
85095524	96-8E9A2/(ZN)SNH-E20_TIA#B	Optipack breakout cable 2.0 mm / Ø 10.8 mm, 96 x 9/125µm G.657.A2, LSFH yellow, TIA fiber colour code
85095516	96-8G50/(ZN)SNH-L20-G_TIA#B	Optipack breakout cable 2.0 mm / Ø 10.8 mm, 96 x 50/125µm OM4, LSFH heather violet, TIA fiber colour code

Optipack 12 – breakout – 2.0 mm up to 144 fibers

Multifiber breakout cable

LSFH™ jacket with 12 fibers for MTP®/MPO



Item no.	Cable type	Description
85092254	24-12E9A2/(ZN)SNH-E20#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 24 x 9/125 µm G.657.A2, LSFH yellow
85089314	48-12E9A2/(ZN)SNH-E20#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 48 x 9/125 µm G.657.A2, LSFH yellow
85093505	48-12G50/(ZN)SNH-M20-F#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 48 x 50/125 µm OM3, LSFH turquoise
85092256	48-12G50/(ZN)SNH-L20-G#B	Optipack breakout cable 2.0 mm / Ø 6.6 mm, 48 x 50/125 µm OM4, LSFH heather violet
85092006	72-12E9A2/(ZN)SNH-E20#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 72 x 9/125 µm G.657.A2, LSFH yellow
t.b.d.	72-12G50/(ZN)SNH-M20-F#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 72 x 50/125 µm OM3, LSFH turquoise
85111308	72-12G50/(ZN)SNH-L20-G#B	Optipack breakout cable 2.0 mm / Ø 7.6 mm, 72 x 50/125 µm OM4, LSFH heather violet
85092007	96-12E9A2/(ZN)SNH-E20#B	Optipack breakout cable 2.0 mm / Ø 9.2 mm, 96 x 9/125 µm G.657.A2, LSFH yellow
85112192	96-12G50/(ZN)SNH-L20-G#B	Optipack breakout cable 2.0 mm / Ø 9.2 mm, 96 x 9/125 µm OM4, LSFH heather violet
85089316	144-12E9A2/(ZN)SNH-E20#B	Optipack breakout cable 2.0 mm / Ø 10.3 mm, 144 x 9/125 µm G.657.A2, LSFH yellow
85096572	144-12G50/(ZN)SNH-M20-F#B	Optipack breakout cable 2.0 mm / Ø 10.3 mm, 144 x 50/125 µm OM3, LSFH turquoise
85092017	144-12G50/(ZN)SNH-L20-G#B	Optipack breakout cable 2.0 mm / Ø 10.3 mm, 144 x 50/125 µm OM4, LSFH heather violet

Order information for indoor cables

Optipack 24 – breakout – 3.0 mm up to 288 fibers

Multifiber breakout cable

LSFH™ jacket with 24 fibers for MTP®/MPO



Item no.	Cable type	Description
85089597	96-24E9A2/(ZN)SNH-E30#B	Optipack breakout cable 3.0 mm / Ø 9.3mm, 96 x 9/125 µm G.657.A2, LSFH yellow
85096647	96-24G50/(ZN)SNH-L30-G#B	Optipack breakout cable 3.0 mm / Ø 9.3mm, 96 x 50/125 µm OM4, LSFH heather violet
85092021	144-24E9A2/(ZN)SNH-E30#B	Optipack breakout cable 3.0 mm / Ø 11.0mm, 144 x 9/125 µm G.657.A2, LSFH yellow
t.b.d.	144-24G50/(ZN)SNH-L30-G#B	Optipack breakout cable 3.0 mm / Ø 11.0mm, 144 x 50/125 µm OM4, LSFH heather violet
85089610	288-24E9A2/(ZN)SNH-E30#B	Optipack Breakout -Kabel 3.0 mm / Ø 14.0 mm, 288 x 9/125 µm G.657.A2, LSFH yellow
85096653	288-24G50/(ZN)SNH-M30-F#B	Optipack breakout cable 3.0mm / Ø 14.0 mm, 288 x 50/125 µm OM3, LSFH turquoise
85096655	288-24G50/(ZN)SNH-L30-G#B	Optipack breakout cable 3.0mm / Ø 14.0 mm, 288 x 50/125 µm OM4, LSFH heather violet

Riser cables (mini breakout)

LSFH™ jacket with tight tube 0.9 mm



Item no.	Cable type	Description
22523404	04-E9/FSN(ZN)H-G50	Riser cable Ø 5.0 mm, 4 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
22521830	04-G50/FSN(ZN)H-G50	Riser cable Ø 5.0 mm, 4 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84101315	04-G50/FSN(ZN)H-G50-F	Riser cable Ø 5.0 mm, 4 x 50/125 µm OM3, tight tube 0.9 mm, LSFH black
22521829	04-G62/FSN(ZN)H-G50	Riser cable Ø 5.0 mm, 4 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black
22523407	12-E9/FSN(ZN)H-G70#D	Riser cable Ø 7.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84047888	12-E9/FSN(ZN)H-E70#D	Riser cable Ø 7.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH yellow
22521838	12-G50/FSN(ZN)H-G70#D	Riser cable Ø 7.0 mm, 12 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84067095	12-G50/FSN(ZN)H-M70-F#D	Riser cable Ø 7.0 mm, 12 x 50/125 µm OM3, tight tube 0.9 mm, LSFH turquoise
84136187	12-G50/FSN(ZN)H-L70-G#D	Riser cable Ø 7.0 mm, 12 x 50/125 µm OM4, tight tube 0.9 mm, LSFH heather violet
22521839	12-G62/FSN(ZN)H-G70#D	Riser cable Ø 7.0 mm, 12 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black
84066463	24-E9/FSN(ZN)H-G88	Riser cable Ø 8.8 mm, 24 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84144587	24-G50/FSN(ZN)H-G88-F	Riser cable Ø 8.8 mm, 24 x 50/125 µm OM3, tight tube 0.9 mm, LSFH black
84110821	24-G50/FSN(ZN)H-G88-G	Riser cable Ø 8.8 mm, 24 x 50/125 µm OM4, tight tube 0.9 mm, LSFH black
84148078	24-G50/FSN(ZN)H-L88-G	Riser cable Ø 8.8 mm, 24 x 50/125 µm OM4, tight tube 0.9 mm, LSFH heather violet

FTTH simplex cables 2.7 mm

LSFH™ jacket with semi-tight tube 0.9 mm



Item no.	Cable type	Description
84075437	01-E9A2/CWJH-H27-FG#D	simplex cable Ø 2.7 mm, 1 x 9/125 µm G.657.A2, semi tight tube 0.9 mm, LSFH light grey
85021554	01-E9A3/CWJH-F27-FG_ blank#D	simplex cable Ø 2.7 mm, 1 x 9/125 µm G.657.A2/B3, semi tight tube 0.9 mm, LSFH white, no labelling

FTTH microtube cables 2.3 mm

LSFH™ jacket up to 4 fibers



Item no.	Cable type	Description
85024198	04-4E9A2/MH(ZN)H-H23#D	FTTH microtube cable Ø 2.3 mm, 4 x 9/125 µm G.657.A2, micro tube 1.25 mm, LSFH light grey
85018124	04-E9A2/MH(ZN)H-E23#D	FTTH microtube cable Ø 2.3mm, 4 x 9/125 µm G.657.A2, micro tube 1.25mm, LSFH yellow

FTTH indoor cables 2.8 mm

LSFH™ jacket with tight tube 0.6 mm



Item no.	Cable type	Description
84067597	04-E9A2/V(ZN)H-H28#D	FTTH indoor cable 2.8 mm, 4 x 9/125 µm G.657.A2, tight tube 0.6 mm, LSFH light grey
84089089	04-E9A2/V(ZN)H-E28#D	FTTH indoor cable 2.8 mm, 4 x 9/125 µm G.657.A2, tight tube 0.6 mm, LSFH yellow

FTTH indoor HOMESTAR cables 4.8 mm

LSFH™ jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84067283	01-E9/F(ZN)H-H48	FTTH indoor cable HOMESTAR Ø 4.8 mm ,1 x 9/125 µm G.657.A1, tight tube 0.6 mm, LSFH light grey
84060987	02-E9/FSN(ZN)H-H48	FTTH indoor cable HOMESTAR Ø 4.8 mm ,2 x 9/125 µm G.657.A1, tight tube 0.6 mm, LSFH light grey
84063363	04-E9/FSN(ZN)H-H48	FTTH indoor cable HOMESTAR Ø 4.8 mm ,4 x 9/125 µm G.657.A1, Vollaader 0.6 mm, LSFH light grey

Order information for universal cables

Jelly-free – dry block non-armoured multifiber loose tube cables – up to 12 fibers

with LSFH™ jacket 3.5 mm



Item no.	Cable type	Description
84097664	12-12E9/BQ(ZN)H-E35	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
84078243	12-12E9/BQ(ZN)H-G35	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
84100920	12-12G50/BQ(ZN)H-D35	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM2, loose tube 2.2 mm, LSFH orange
84078253	12-12G50/BQ(ZN)H-G35	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM2, loose tube 2.2 mm, LSFH black
84097603	12-12G50/BQ(ZN)H-M35-F	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM3, loose tube 2.2 mm, LSFH turquoise
84121860	12-12G50/BQ(ZN)H-L35-G	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM4, loose tube 2.2 mm, LSFH heather violet
84101922	12-12G62/BQ(ZN)H-D35	Jelly-free non-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 62.5/125 µm OM1, loose tube 2.2 mm, LSFH orange

Jelly-free – dry block non-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 5.0 mm



Item no.	Cable type	Description
22523600	12-12E9/Q(ZN)H-E50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH yellow
22521597	12-12G50/Q(ZN)H-D50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LSFH orange
84075870	12-12G50/Q(ZN)H-M50-F	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
85017189	12-12G50/Q(ZN)H-L50-G	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
22521598	12-12G62/Q(ZN)H-D50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH orange
85030580	24-24E9/Q(ZN)H-E50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH yellow
85030581	24-24G50/Q(ZN)H-D50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH orange
85030582	24-24G50/Q(ZN)H-M50-F	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
85030583	24-24G50/Q(ZN)H-L50-G	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
85030585	24-24G62/Q(ZN)H-D50	Jelly-free non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH orange

Jelly-free – dry block glass-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 7.0 mm



Item no.	Cable type	Description
85020587	12-12E9/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85008099	12-12E9A2/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.657.A2, loose tube 2.8 mm, LSFH black
85026736	12-12E9A2/Q(ZNG)H-G70-UR	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.657.A2, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85026737	12-12G50/Q(ZNG)H-G70-UR	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85026277	12-12G50/Q(ZNG)H-G70-F#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
85026738	12-12G50/Q(ZNG)H-G70-F-UR	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85026278	12-12G50/Q(ZNG)H-G70-G#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH black
85026739	12-12G50/Q(ZNG)H-G70-G-UR	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85024090	12-12G62/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
85026740	12-12G62/Q(ZNG)H-G70-UR	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85030630	24-24E9/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85029988	24-24E9A2/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 9/125 µm G.657.A2, loose tube 2.8 mm, LSFH black
85030631	24-24G50/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
85024091	24-24G62/Q(ZNG)H-G70#D	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black

Order information for universal cables

Jelly-free – dry block glass-armoured multifiber loose tube cables - up to 24 fibers

with LSFH™-cable jacket 7.0 mm CPR-class Cca



Item no.	Cable type	Description
85103589	06-6E9/Q(ZNG)H-E70#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 6 x 9/125µm G.652.D, loose tube 2.8 mm, LSFH yellow
85103600	06-6G50/Q(ZNG)H-M70-F#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 6 x 50/125µm OM3, loose tube 2.8 mm, LSFH turquoise
85103601	06-6G50/Q(ZNG)H-L70-G#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 6 x 50/125µm OM4, loose tube 2.8 mm, LSFH heather violet
85103602	12-12E9/Q(ZNG)H-E70#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125µm G.652.D, loose tube 2.8 mm, LSFH yellow
85103603	12-12G50/Q(ZNG)H-M70-F#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125µm OM3, loose tube 2.8 mm, LSFH turquoise
85103604	12-12G50/Q(ZNG)H-L70-G#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125µm OM4, loose tube 2.8 mm, LSFH heather violet
85103605	24-24E9/Q(ZNG)H-E70#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 9/125µm G.652.D, loose tube 2.8 mm, LSFH yellow
85103606	24-24G50/Q(ZNG)H-M70-F#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125µm OM3, loose tube 2.8 mm, LSFH turquoise
85103607	24-24G50/Q(ZNG)H-L70-G#C	Jelly-free glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125µm OM4, loose tube 2.8 mm, LSFH heather violet

Jelly-free – dry block glass-armoured multifiber loose tube cables - up to 24 fibers

with LSFH™ jacket 12.0 mm



Item no.	Cable type	Description
85078322	12-12E9/Q(ZNG)H-E120#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH yellow
85091344	12-12G50/Q(ZNG)H-M120-F#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
85091346	12-12G50/Q(ZNG)H-L120-G#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
85091343	24-24E9/Q(ZNG)H-E120#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH yellow
85091345	24-24G50/Q(ZNG)H-M120-F#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
85091347	24-24G50/Q(ZNG)H-L120-G#B	Jelly-free glass-armoured multifiber loose tube cable Ø 12.0 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet

Jelly-free – dry block TWINTUBE glass-armoured multifiber loose tube cables - up to 48 fibers

with LSFH™ jacket 9.4 mm



Item no.	Cable type	Description
85085349	24-12E9/Q(ZNG)H-E94#D	Jelly-free TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH yellow
85085351	24-12G50/Q(ZNG)H-L94-G#D	Jelly-free TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
85096760	24-12G50/Q(ZNG)H-M94-F#D	Jelly-free TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise

Jelly-free – glass-armoured multifiber loose tube cables - up to 144 fibers
with LSFH™ jacket



Item no.	Cable type	Description
85118114	24-12E9/BQSN(ZNG)H-G100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85115193	24-12E9/BQSN(ZNG)H-E100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85128546	24-12E9/BQSN(ZNG)H-Z100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black with 2 orange stripes
85118115	24-12G50/BQSN(ZNG)H-M100-F#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 24 x 50/125 µm OM3, loose tube 2.2 mm, LSFH turquoise
85115194	24-12G50/BQSN(ZNG)H-L100-G#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 24 x 50/125 µm OM4, loose tube 2.2 mm, LSFH heather violet
85103930	48-12E9/BQSN(ZNG)H-G100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85115191	48-12E9/BQSN(ZNG)H-E100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85137884	48-12E9/BQSN(ZNG)H-Z100#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black with 2 orange stripes
85115192	48-12G50/BQSN(ZNG)H-L100-G#C	Jelly-free glass-armoured multifiber loose tube cable Ø 10.0 mm, 48 x 50/125 µm OM4, loose tube 2.2 mm, LSFH heather violet
85125938	72-12E9/BQSN(ZNG)H-G110#C	Jelly-free glass-armoured multifiber loose tube cable Ø 11.0 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85112820	72-12E9/BQSN(ZNG)H-E110#C	Jelly-free glass-armoured multifiber loose tube cable Ø 11.0 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85125547	72-12E9/BQSN(ZNG)H-Z110#C	Jelly-free glass-armoured multifiber loose tube cable Ø 11.0 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black with 2 orange stripes
85112821	96-12E9/BQSN(ZNG)H-E126#C	Jelly-free glass-armoured multifiber loose tube cable Ø 12.6 mm, 96 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85112819	144-12E9/BQSN(ZNG)H-E150#C	Jelly-free glass-armoured multifiber loose tube cable Ø 15.0 mm, 144 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85127962	144-12E9/BQSN(ZNG)H-Z150#C	Jelly-free glass-armoured multifiber loose tube cable Ø 15.0 mm, 144 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black with 2 orange stripes

Order information for universal cables

Jelly-free - glass-armoured multifiber loose tube cables - up to 144 fibers with LSFH™ jacket



Item no.	Cable type	Description
85065362	48-12E9/BQSN(ZNG)H-G96#D	Jelly-free glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85087167	48-12E9/BQSN(ZNG)H-E96#D	Jelly-free glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85087168	48-12G50/BQSN(ZNG)H-M96-F#D	Jelly-free glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 50/125 µm OM3, loose tube 2.2 mm, LSFH turquoise
85087169	48-12G50/BQSN(ZNG)H-L96-G#D	Jelly-free glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 50/125 µm OM4, loose tube 2.2 mm, LSFH heather violet
85065360	72-12E9/BQSN(ZNG)H-G106#D	Jelly-free glass-armoured multifiber loose tube cable Ø 10.6mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85065361	72-12G50/BQSN(ZNG)H-G106-G#D	Jelly-free glass-armoured multifiber loose tube cable Ø 10.6mm, 72 x 50/125 µm OM4, loose tube 2.2 mm, LSFH black
85064348	96-12E9/BQSN(ZNG)H-G122#D	Jelly-free glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85071047	96-12E9/BQSN(ZNG)H-E122#D	Jelly-free glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH yellow
85065359	96-12G50/BQSN(ZNG)H-G122-G#D	Jelly-free glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 50/125 µm OM4, loose tube 2.2 mm, LSFH black
85080531	96-12G50/BQSN(ZNG)H-L122-G#D	Jelly-free glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 50/125 µm OM4, loose tube 2.2 mm, LSFH heather violet
85030405	144-12E9/BQSN(ZNG)H-G145#E	Jelly-free glass-armoured multifiber loose tube cable Ø 14.5mm, 144 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85064347	144-12G50/BQSN(ZNG)H-G145-G#E	Jelly-free glass-armoured multifiber loose tube cable Ø 14.5mm, 144 x 50/125 µm OM4, loose tube 2.2 mm, LSFH black

Non-armoured multifiber loose tube cables – up to 12 fibers with LSFH™ jacket 3.5 mm



Item no.	Cable type	Description
84047624	04-4E9/BW(ZN)H-G35	glass-armoured multifiber loose tube cable Ø 3.5 mm, 4 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
84047675	04-4G50/BW(ZN)H-G35	glass-armoured multifiber loose tube cable Ø 3.5 mm, 4 x 50/125 µm OM2, loose tube 2.2 mm, LSFH black
84047679	04-4G50/BW(ZN)H-G35-F	glass-armoured multifiber loose tube cable Ø 3.5 mm, 4 x 50/125 µm OM3, loose tube 2.2 mm, LSFH black
84047685	04-4G62/BW(ZN)H-G35	glass-armoured multifiber loose tube cable Ø 3.5 mm, 4 x 62.5/125 µm OM1, loose tube 2.2 mm, LSFH black
84041870	12-12E9/BW(ZN)H-G35	glass-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
84041871	12-12G50/BW(ZN)H-G35	12-fiber, 50 glass-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM2, loose tube 2.2 mm, LSFH black/125 µm OM2, Ø 3.5 mm, jacket LSFH black
84047681	12-12G50/BW(ZN)H-G35-F	glass-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM3, loose tube 2.2 mm, LSFH black
84148346	12-12G50/BW(ZN)H-G35-G	glass-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 50/125 µm OM4, loose tube 2.2 mm, LSFH black
84047687	12-12G62/BW(ZN)H-G35	glass-armoured multifiber loose tube cable Ø 3.5 mm, 12 x 62.5/125 µm OM1, loose tube 2.2 mm, LSFH black

Non-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 5.0 mm



Item no.	Cable type	Description
84108343	02-2G62/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 2 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84108894	02-2H200/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 2 x 200/230/500µm HCS H200, loose tube 2.8 mm, LSFH black
84108346	04-4E9/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
84069256	04-4G50/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84108341	04-4G62/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84108344	08-8G50/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 8 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84132158	12-12E9/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85021644	12-12G50/W(ZN)H-G50-F	glass-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
85001237	24-24E9/W(ZN)H-G50	glass-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 9/125 µm G.657.A1, loose tube 2.8 mm, LSFH black
85021642	24-24G50/W(ZN)H-G50-F	glass-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black

Glass-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 7.0 mm



Item no.	Cable type	Description
85002413	12-12E9/W(ZNG)H-G70#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85008736	12-12E9/W(ZNG)H-G70-UR	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
85003105	12-12G50/W(ZNG)H-G70#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
85019849	12-12G50/W(ZNG)H-G70-F#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
85024024	12-12G62/W(ZNG)H-G70#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
85003102	24-24E9/W(ZNG)H-G70#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85008320	24-24E9/W(ZNG)H-G70-UR	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
85014307	24-24G50/W(ZNG)H-G70#D#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
85019851	24-24G50/W(ZNG)H-G70-F	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
85024025	24-24G62/W(ZNG)H-G70#D	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black

Order information for universal cables

Glass-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 8.5 mm



Item no.	Cable type	Description
85016377	02-2H200/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 2 x 200/230/500µm HCS H200, loose tube 2.8 mm, LSFH black
84126548	04-4E9/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
22523601	04-4G50/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84033253	04-4G50/W(ZNG)H-M85-F#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
84122492	04-4G50/W(ZNG)H-L85-G#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
22523603	04-4G62/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84090674	06-6G50/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84134847	06-6G50/W(ZNG)H-G85-UR	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
84099044	06-6G50/W(ZNG)H-M85-F#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
85001045	06-6G50/W(ZNG)H-L85-G#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
84145412	06-6G62/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84080161	08-8E9/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
22523602	08-8G50/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
22523604	08-8G62/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
22523654	12-12E9/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
22521943	12-12G50/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84003589	12-12G50/W(ZNG)H-G85-F#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
84005134	12-12G50/W(ZNG)H-M85-F#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
84098491	12-12G50/W(ZNG)H-G85-G#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH black
84121676	12-12G50/W(ZNG)H-L85-G#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
22521884	12-12G62/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84127251	24-24E9/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
84134851	24-24E9/W(ZNG)H-G85-UR	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
84127282	24-24G50/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84134852	24-24G50/W(ZNG)H-G85-UR	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black, UL rating OFN/OFNG
84137563	24-24G50/W(ZNG)H-G85-F#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
85013188	24-24G50/W(ZNG)H-G85-G#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LSFH black
85008171	24-24G62/W(ZNG)H-G85#D	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black

Glass-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 12 mm



Item no.	Cable type	Description
84021028	12-12E9/W(ZNG)H-Z120	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black with 2 orange stripes
84021029	12-12G50/W(ZNG)H-Z120-F	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black with 2 orange stripes

TWINTUBE glass-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket



Item no.	Cable type	Description
23041032	24-12E9/W(ZNG)H-G94#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
23038139	24-12G50/W(ZNG)H-G94#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84003522	24-12G50/W(ZNG)H-M94-F#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH turquoise
84066472	24-12G50/W(ZNG)H-G94-F#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LSFH black
84121635	24-12G50/W(ZNG)H-L94-G#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LSFH heather violet
23041033	24-12G62/W(ZNG)H-G94#D	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black

Glass-armoured mini multifiber loose tube cables – up to 144 fibers

with LSFH™ jacket



Item no.	Cable type	Description
85030051	24-12E9/BWSN(ZNG)H-G96#D	glass-armoured multifiber loose tube cable Ø 9.6 mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85032261	24-12G50/BWSN(ZNG)H-G96-F#D	glass-armoured multifiber loose tube cable Ø 9.6 mm, 24 x 50/125 µm OM3, loose tube 2.2 mm, LSFH black
85020262	48-12E9/BWSN(ZNG)H-G96#D	glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85063647	48-12G50/BWSN(ZNG)H-G96-F#D	glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 50/125 µm OM3, loose tube 2.2 mm, LSFH black
85032252	48-12G50/BWSN(ZNG)H-G96-G#D	glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 50/125 µm OM4, loose tube 2.2 mm, LSFH black
85029362	72-12E9/BWSN(ZNG)H-G106	glass-armoured multifiber loose tube cable Ø 10.6 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85029364	96-12E9/BWSN(ZNG)H-G122	glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85029363	120-12E9/BWSN(ZNG)H-G136	glass-armoured multifiber loose tube cable Ø 13.6 mm, 120 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85023058	144-12E9/BWSN(ZNG)H-G145	glass-armoured multifiber loose tube cable Ø 14.5 mm, 144 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black

Order information for universal cables

TWINTUBE steel-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 12.5 mm



Item no.	Cable type	Description
84075229	24-12E9/W(ZN)HAH-G125	TWINTUBE steel-armoured multifiber loose tube cable Ø 12.5mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
84141130	24-12G62/W(ZN)HAH-G125	TWINTUBE steel-armoured multifiber loose tube cable Ø 12.5mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black

Steel-armoured multifiber loose tube cables – up to 24 fibers

with LSFH™ jacket 8 mm



Item no.	Cable type	Description
85002232	04-4E9/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 4 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85008296	04-4G50/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84100820	04-4G62/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84139047	06-6E9/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 6 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
85001987	06-6G62/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 6 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black
84126592	12-12E9/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black
84136457	12-12G50/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LSFH black
84122522	12-12G62/W(ZN)HAH-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LSFH black

Steel-armoured multifiber loose tube cables – up to 72 fibers

with LSFH™ jacket



Item no.	Cable type	Description
85030099	48-12E9/BWSN(ZNG)HAH-G130	steel-armoured multifiber loose tube cable Ø 13.0 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black
85030100	72-12E9/BWSN(ZNG)HAH-G140	steel-armoured multifiber loose tube cable Ø 14.0 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, LSFH black

Order information for outdoor cables

Non-armoured multifiber loose tube cable – up to 12 fibers

with PE jacket 3.5 mm



Item no.	Cable type	Description
tbd	04-4E9/BW(ZN)V-G35	non-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 9/125 µm G.652.D, loose tube 2.2 mm, LDPE black
84098852	12-12E9/BW(ZN)V-G35	non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.2 mm, LDPE black

Non-armoured multifiber loose tube cables – up to 24 fibers

with PE jacket 5.0 mm



Item no.	Cable type	Description
84150182	04-4E9/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22520723	04-4G50/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22520687	04-4G62/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
84150184	08-8E9/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 8 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22520688	08-8G50/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 8 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22520740	08-8G62/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 8 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
84150192	12-12E9/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22521250	12-12G50/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22521251	12-12G62/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
85001052	24-24E9/W(ZN)Y-G50	non-armoured multifiber loose tube cable Ø 5.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black

Glass-armoured multifiber loose tube cables – up to 24 fibers

with PE jacket 7.0 mm



Item no.	Cable type	Description
85108006	12-12E9/W(ZNG)Y-G70	glass-armoured multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
85108007	24-24E9/W(ZNG)Y-G70	glass-armoured multifiber loose tube cable Ø 7.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black

Order information for outdoor cables

Glass-armoured multifiber loose tube cables – up to 24 fibers

with PE jacket 8.5 mm



Item no.	Cable type	Description
22521811	02-2G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 2 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22521749	02-2G62/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 2 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
22523652	02-2H200/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 2 x 200/230/500µm HCS H200, loose tube 2.8 mm, LDPE black
22523661	04-4E9/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22521750	04-4G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22521751	04-4G62/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
22523653	04-4H200/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 200/230/500 µm HCS H200, loose tube 2.8 mm, LDPE black
22521752	06-6G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22521753	06-6G62/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 6 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
23017688	08-8E9/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22521754	08-8G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22521755	08-8G62/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 8 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
22521756	12-12E9/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22521757	12-12G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
23027099	12-12G50/W(ZNG)Y-G85-F	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, LDPE black
22521758	12-12G62/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
84024359	24-24E9/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
84024360	24-24G50/W(ZNG)Y-G85	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
85010701	24-24G50/W(ZNG)Y-G85-F	glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LDPE black

Glass-armoured multifiber loose tube cables – up to 24 fibers

with PE jacket 12 mm



Item no.	Cable type	Description
22523657	12-12E9/W(ZNG)Y-Z120	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black with 2 orange stripes
22523655	12-12G50/W(ZNG)Y-Z120	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black with 2 orange stripes
22523656	12-12G62/W(ZNG)Y-Z120	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black with 2 orange stripes
84072782	24-24E9/W(ZNG)Y-Z120	glass-armoured multifiber loose tube cable Ø 12.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black with 2 orange stripes

TWINTUBE glass-armoured multifiber loose tube cables – up to 24 fibers

with PE jacket 9.4 mm



Item no.	Cable type	Description
23038137	24-12E9/W(ZNG)Y-G94	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
23038138	24-12G50/W(ZNG)Y-G94	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
23041030	24-12G50/W(ZNG)Y-G94-F	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM3, loose tube 2.8 mm, LDPE turquoise
84118482	24-12G50/W(ZNG)Y-G94-G	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 50/125 µm OM4, loose tube 2.8 mm, LDPE black
23041031	24-12G62/W(ZNG)Y-G94	TWINTUBE glass-armoured multifiber loose tube cable Ø 9.4 mm, 24 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black

Glass-armoured multifiber loose tube cables – up to 144 fibers

with PE jacket



Item no.	Cable type	Description
85030052	24-12E9/BWSN(ZNG)V-G96	glass-armoured multifiber loose tube cable Ø 9.6 mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes
85022307	48-12E9/BWSN(ZNG)V-G96	glass-armoured multifiber loose tube cable Ø 9.6 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes
85025379	72-12E9/BWSN(ZNG)V-G106	glass-armoured multifiber loose tube cable Ø 10.6 mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes
85025378	96-12E9/BWSN(ZNG)V-G122	glass-armoured multifiber loose tube cable Ø 12.2 mm, 96 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes
85025390	120-12E9/BWSN(ZNG)V-G136	glass-armoured multifiber loose tube cable Ø 13.6 mm, 120 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes
85025391	144-12E9/BWSN(ZNG)V-G145	glass-armoured multifiber loose tube cable Ø 14.5 mm, 144 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black with 2 orange stripes

Steel-armoured multifiber loose tube cables– up to 24 fibers

with PE jacket 8.0 mm



Item no.	Cable type	Description
84144111	04-4G50/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 4 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
85023197	04-4G62/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 4 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
84092334	06-6G50/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 6 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
84145972	08-8G62/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 8 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
22523660	12-12E9/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black
22523658	12-12G50/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, LDPE black
22523659	12-12G62/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, LDPE black
tbd	24-24E9/W(ZN)YAY-G80	steel-armoured multifiber loose tube cable Ø 8.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LDPE black

Order information for outdoor cables

TWINTUBE steel-armoured multifiber loose tube cables – up to 24 fibers with PE jacket 12.5 mm



Item no.	Cable type	Description
tbd	24-12E9/W(ZNG)YAY-G125	steel-armoured multifiber loose tube cable Ø 12.5mm, 24 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black
85030532	24-12G50/W(ZNG)YAY-G125	steel-armoured multifiber loose tube cable Ø 12.5mm, 24 x 50/125 µm OM2, loose tube 2.2 mm, HDPE black
85032029	24-12G62/W(ZNG)YAY-G125	steel-armoured multifiber loose tube cable Ø 12.5mm, 24 x 62.5/125 µm OM1, loose tube 2.2 mm, LDPE black

Steel-armoured multifiber loose tube cables – up to 72 fibers with PE jacket



Item no.	Cable type	Description
85030101	48-12E9/BWSN(ZNG)VAV-G130	steel-armoured multifiber loose tube cable Ø 13.0 mm, 48 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black
85030102	72-12E9/BWSN(ZNG)VAV-G140	steel-armoured multifiber loose tube cable Ø 14.0mm, 72 x 9/125 µm G.652.D, loose tube 2.2 mm, HDPE black

Order information for special cables

Simplex cables 1.9 mm

PUR jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84032682	01-E9/FJZ-E19	simplex cable Ø 1.9 mm, 1 x 9/125 µm G.652.D / G.657-A1, tight tube 0.9 mm, PUR yellow
84063323	01-E9A2/FJZ-E19-FG	simplex cable Ø 1.9 mm, 1 x 9/125 µm G.657.A2, tight tube 0.9 mm, PUR yellow
84032683	01-G50/FJZ-D19	simplex cable Ø 1.9 mm, 1 x 50/125 µm OM2, tight tube 0.9 mm, PUR orange
84068995	01-G50/FJZ-D19-F	simplex cable Ø 1.9 mm, 1 x 50/125 µm OM3, tight tube 0.9 mm, PUR orange
84037265	01-G62/FJZ-D19	simplex cable Ø 1.9 mm, 1 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR orange

Rugged simplex cables 6.0 mm

PUR jacket with 2.7 mm/tight tube 0.9 mm



Item no.	Cable type	Description
22523102	01-G50/FJH(ZN)Z-D27	rugged simplex cable 2.7 mm / Ø 6.0 mm, 1 x 50/125 µm OM2, tight tube 0.9 mm, PUR orange
22523103	01-G62/FJH(ZN)Z-B27	rugged simplex cable 2.7 mm / Ø 6.0 mm, 1 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR grün
84020985	01-H200/FJH(ZN)Z-D27	rugged simplex cable 2.7 mm / Ø 6.0 mm, 1 x 200/230/500 µm HCS H200, tight tube 0.9 mm, PUR orange

Rugged minicord breakout cables

PUR jacket with simplex 1.7 mm/tight tube 0.9 mm



Item no.	Cable type	Description
84010318	02-E9/FJ(ZN)Z-G17	rugged minicord breakout cable 1.7mm / Ø 6.0 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84080260	02-E9A2/FJ(ZN)Z-G17-FG	rugged minicord breakout cable 1.7mm / Ø 6.0 mm, 2 x 9/125 µm G.657.A2, tight tube 0.9 mm, PUR black
23037747	02-G50/FJ(ZN)Z-G17	rugged minicord breakout cable 1.7mm / Ø 6.0 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
23037748	02-G62/FJ(ZN)Z-G17	rugged minicord breakout cable 1.7mm / Ø 6.0 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black
23037749	02-H200/FJ(ZN)Z-G17	rugged minicord breakout cable 1.7mm / Ø 6.0 mm, 2 x 200/230/500 µm HCS H200, tight tube 0.5 mm, PUR black

TWINFLEX Industrial Link

PUR jacket with simplex 2.2 mm/tight tube 0.9 mm



Item no.	Cable type	Description
84045039	02-G50/FJ(ZN)Z-G22	Industry Link TWINFLEX non-armoured breakout cable 2.2 mm / Ø 7.5 x 8.0 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84045188	02-G62/FJ(ZN)Z-G22	Industry Link TWINFLEX non-armoured breakout cable 2.2 mm / Ø 7.5 x 8.0 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, black
84045184	02-H200/VJ(ZN)Z-G22	Industry Link TWINFLEX non-armoured breakout cable 2.2 mm / Ø 7.5 x 8.0 mm, 2 x 200/230/500µm HCS H200, tight tube 0.9 mm, PUR black
84057089	02-POF980/M(ZN)Z-G22	Industry Link TWINFLEX non-armoured breakout cable 2.2 mm / Ø 7.5 x 8.0 mm, 2 x POF 980/1000 µm, LSFH black

Order information for special cables

TWINFIX Industrial Link

LSFH™ jacket with simplex 2.2 mm/tight tube 0.9 mm



Item no.	Cable type	Description
84118658	02-E9/FJ(ZNG)H-G22#D	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84045041	02-G50/FJ(ZNG)H-G22#D	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84125961	02-G50/FJ(ZNG)H-G22-UN	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84045187	02-G62/FJ(ZNG)H-G22#D	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black
84125963	02-G62/FJ(ZNG)H-G22-UN	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84043741	02-H200/VJ(ZNG)H-G22#D	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 200/230/500µm HCS H200, tight tube 0.9 mm, LSFH black
84057090	02-POF980/M(ZNG)H-G22	Industry Link TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x POF 980/1000µm, LSFH black

RADOX® TWINFIX

RADOX® jacket with simplex 2.2 mm/tight tube 0.9 mm



Item no.	Cable type	Description
85022456	02-G50/FJ(ZNG)R-G22	Industry Link RADOX® TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, RADOX® black
85102458	02-G50/FJ(ZNG)R-D22-F	Industry Link RADOX® TWINFIX glass-armoured breakout cable 2.2 mm / Ø 7.5 x 7.2 mm, 2 x 50/125 µm OM3, tight tube 0.9 mm, RADOX® orange

QUADFIX Industrial Link

LSFH™ jacket with simplex 2.2 mm/tight tube 0.9 mm



Item no.	Cable type	Description
84102119	04-E9/FJ(ZNG)H-G22#C	Industry Link QUADFIX glass-armoured breakout cable 2.2 mm / Ø 9.0 mm, 4 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84092090	04-G50/FJ(ZNG)H-G22#C	Industry Link QUADFIX glass-armoured breakout cable 2.2 mm / Ø 9.0 mm, 4 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84092091	04-G62/FJ(ZNG)H-G22#C	Industry Link QUADFIX glass-armoured breakout cable 2.2 mm / Ø 9.0 mm, 4 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black
tbd	04-H200/VJ(ZNG)H-G22#C	Industry Link QUADFIX glass-armoured breakout cable 2.2 mm / Ø 9.0 mm, 4 x 200/230/500µm HCS H200, tight tube 0.5mm, LSFH black

Aramid-free simplex cables

LSFH – cable jacket with tight tube



Item no.	Cable type	Description
85091707	01-H200/VH-G20	simplex cable Ø 2.0 mm, 1 x 200/230/500 µm HCS H200, tight tube 0.5 mm, LSFH black
85089356	01-G62/FH-G20	simplex cable Ø 2.0 mm, 1 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black

Mobile field cable

PUR – cable jacket with loose tube



Item no.	Cable type	Description
85138084	12-12E9A2/EW(ZN)Z-G60	mobile field cable Ø 6.0 mm, 12 x 9/125 µm G.657.A2, loose tube 3.0 mm, PUR black

Mobile field cables

PUR jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84096489	02-E9/FSN(ZN)Z-G56	mobile field cable Ø 5.6 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84096494	02-G50/FSN(ZN)Z-G56	mobile field cable Ø 5.6 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
85023837	02-G50/FSN(ZN)Z-G56-F	mobile field cable Ø 5.6 mm, 2 x 50/125 µm OM3, tight tube 0.9 mm, PUR black
84035585	04-E9/FSN(ZN)Z-G56	mobile field cable Ø 5.6 mm, 4 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84035586	04-G50/FSN(ZN)Z-G56	mobile field cable Ø 5.6 mm, 4 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84035587	04-G62/FSN(ZN)Z-G56	mobile field cable Ø 5.6 mm, 4 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black
84016109	08-E9/FSN(ZN)Z-G68	mobile field cable Ø 6.8 mm, 8 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84016115	08-G50/FSN(ZN)Z-G68	mobile field cable Ø 6.8 mm, 8 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84013027	08-G62/FSN(ZN)Z-G68	mobile field cable Ø 6.8 mm, 8 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black
84016119	12-E9/FSN(ZN)Z-G80	mobile field cable Ø 8.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84016120	12-G50/FSN(ZN)Z-G80	mobile field cable Ø 8.0 mm, 12 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84038810	12-G62/FSN(ZN)Z-G80	mobile field cable Ø 8.0 mm, 12 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black

Glass-armoured riser cables – 2 fibers

LSFH™ jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84118844	02-E9A2/F(ZNG)H-G48	glass-armoured riser cable Ø 4.8 mm, 2 x 9/125 µm G.657.A2, tight tube 0.9 mm, LSFH black
84142653	02-E9A2/F(ZNG)H-G48-UR	glass-armoured riser cable Ø 4.8 mm, 2 x 9/125 µm G.657.A2, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84130268	02-G50/F(ZNG)H-G48-F	glass-armoured riser cable Ø 4.8 mm, 2 x 50/125 µm OM3, tight tube 0.9 mm, LSFH black
84080315	02-E9/F(ZNG)H-G55	glass-armoured riser cable Ø 5.5 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84128336	02-E9A1/F(ZNG)H-G55-UR	glass-armoured riser cable Ø 5.5 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84066685	02-G50/F(ZNG)H-G55	glass-armoured riser cable Ø 5.5 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84128340	02-G50/F(ZNG)H-G55-UR	glass-armoured riser cable Ø 5.5 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84129729	02-G62/F(ZNG)H-G55#D	glass-armoured riser cable Ø 5.5 mm, 2 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black
84080314	02-E9/F(ZNG)H-G70	glass-armoured riser cable Ø 7.0 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84128357	02-E9/F(ZNG)H-G70-UR	glass-armoured riser cable Ø 7.0 mm, 2 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG
84125119	02-G50/F(ZNG)H-G70	glass-armoured riser cable Ø 7.0 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84066684	02-G50/F(ZNG)H-G70-UR	glass-armoured riser cable Ø 7.0 mm, 2 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black, UL rating OFN/OFNG

Order information for special cables

Glass-armoured riser cables – 4 fibers

LSFH™ jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84104260	04-E9/FSN(ZNG)H-G55	glass-armoured riser cable Ø 5.5 mm, 4 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, LSFH black
84075876	04-G50/FSN(ZNG)H-G55	glass-armoured riser cable Ø 5.5 mm, 4 x 50/125 µm OM2, tight tube 0.9 mm, LSFH black
84129724	04-G62/FSN(ZNG)H-G55	glass-armoured riser cable Ø 5.5 mm, 4 x 62.5/125 µm OM1, tight tube 0.9 mm, LSFH black 5/125 µm OM1, Ø 5.5 mm, tight tube LSFH, black

Rugged multifiber loose tube cables – up to 24 fibers (dry block)

with 7.0 mm PUR jacket



Item no.	Cable type	Description
85027090	12-12E9/Q(ZNG)Z-G70	jelly-free rugged multifiber loose tube cable Ø 7.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, PUR black
tbd	12-12G50/Q(ZNG)Z-G70	jelly-free rugged multifiber loose tube cable Ø 7.0 mm, 12 x 50/125 µm OM2, loose tube 2.8 mm, PUR black
tbd	12-12G62/Q(ZNG)Z-G70	jelly-free rugged multifiber loose tube cable Ø 7.0 mm, 12 x 62.5/125 µm OM1, loose tube 2.8 mm, PUR black
85096167	24-24E9/Q(ZNG)Z-G70	jelly-free rugged multifiber loose tube cable Ø 7.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8mm, PUR black

RADOX® glass-armoured multifiber loose tube cables – up to 24 fibers

with 8.5 mm RADOX jacket



Item no.	Cable type	Description
85029474	04-4E9A2/W(ZNG)R-G85#C	RADOX glass-armoured multifiber loose tube cable Ø 8.5 mm, 4 x 9/125 µm G.657.A2, loose tube 2.8 mm, RADOX black
85001138	12-12E9A2/W(ZNG)R-G85#C	RADOX glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 9/125 µm G.657.A2, loose tube 2.8 mm, RADOX black
85001358	12-12G50/W(ZNG)R-C85-F#C	RADOX glass-armoured multifiber loose tube cable Ø 8.5 mm, 12 x 50/125 µm OM3, loose tube 2.8 mm, RADOX blue
85007541	24-24E9A2/W(ZNG)R-G85#C	RADOX glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 9/125 µm G.657.A2, loose tube 2.8 mm, RADOX black
85086714	24-24G50/W(ZNG)R-G85#C	RADOX glass-armoured multifiber loose tube cable Ø 8.5 mm, 24 x 9/125 µm G.657.A2, loose tube 2.8 mm, RADOX black

DNV GL Type approved multifiber loose tube cable steel-armoured

with RADOX® jacket



Item no.	Cable type	Description
85080631	12-12E9/W(ZN)HAR-G82-DNV	steel-armoured multifiber loose tube cable Ø 8.2mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, RADOX black, DNV GL
85080632	24-24E9/W(ZN)HAR-G82-DNV	steel-armoured multifiber loose tube cable Ø 8.2mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, RADOX black, DNV GL

DNV GL Type approved multifiber loose tube cable glass-armoured

with LSFH™ jacket



Item no.	Cable type	Description
85080591	12-12E9/W(ZNG)H-G120-DNV	glass-armoured multifiber loose tube cable Ø 12.0 mm, 12 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black, DNV GL
85080592	24-24E9/W(ZNG)H-G120-DNV	glass-armoured multifiber loose tube cable Ø 12.0 mm, 24 x 9/125 µm G.652.D, loose tube 2.8 mm, LSFH black, DNV GL

Drag chain cables – up to 12 fibers

PUR jacket with tight tube 0.9 mm



Item no.	Cable type	Description
84104254	04-G50/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 4 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84074001	04-G50/FSN(ZN)YZ-G130-F	drag chain cable Ø 13.0 mm, 4 x 50/125 µm OM3, tight tube 0.9 mm, PUR black
84006996	06-G50/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 6 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84006999	06-G62/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 6 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black
84006997	08-G50/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 8 x 50/125 µm OM2, tight tube 0.9 mm, PUR black
84034417	12-E9/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, PUR black
84006998	12-G50/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 12 x 50/125 µm OM2, tight tube 0.9 mm, PUR black OM2, Ø 13 mm, tight tube PUR, black
84007000	12-G62/FSN(ZN)YZ-G130	drag chain cable Ø 13.0 mm, 12 x 62.5/125 µm OM1, tight tube 0.9 mm, PUR black

Drag chain cables – up to 12 fibers

RADOX® jacket with tight tube 0.9 mm



Item no.	Cable type	Description
85078691	12-E9/FSN(ZN)YR-G130	drag chain cable Ø 13.0 mm, 12 x 9/125 µm G.652.D/G.657.A1, tight tube 0.9 mm, RADOX black

Technical terms English – German

Tubes	Adern
Tight tube	Vollader
Semi-tight tube	Kompaktader
Suitable for direct connector assembly	Für direkte Steckermontage geeignet
High kink resistance	Hohe Knickfestigkeit
Tight bending radii	Enge Biegeradien
Up to ... m can be stripped in one piece	Abisolierbarkeit der Ader ... m
Optimal for pigtail assemblies for splicing purpose	Optimal für einseitig konfektionierte Leitungen zu Spleisszwecken
High flexibility	Hohe Flexibilität
Suited for high thermal requirements	Breiter Einsatztemperaturbereich

Indoor cables	Innenkabel
Single-fiber cable	Simplexkabel (Einzelfaserkabel)
Duplex	Duplexkabel (2-fasrig)
Breakout	Breakout
Riser	Riser
Tactical field cable	Taktisches Feldkabel
Metal-free indoor cable	Metallfreies Innenkabel
Each fiber is strain-relieved	Jeder LWL zugentlastet
Single-fiber cable easy to separate	Einfach zu trennender Mantelsteg
Easy jacket strippability	Mantel gut absetzbar
Suitable for direct connector assembly	Für direkte Steckermontage geeignet
Self-extinguishing, low smoke and halogen-free jacket material	Selbstverlöschendes, halogenfreies und raucharmes Mantelmaterial
Self-extinguishing, low smoke and halogen-free	Selbstverlöschend, halogenfrei und raucharm
Up to ... m can be stripped in one piece	Abisolierbarkeit der Ader in ... m an einem Stück
Crush resistant	Trittfest
For high mechanical and thermal requirements	Für hohe mechanische und thermische Ansprüche
Tight tube cable design	Volladeraufbau
Suitable for repeated cable winding	Geeignet für wiederholtes Auf- und Abwickeln
Suited for highest mechanical and thermal requirements	Für höchste mechanische und thermische Ansprüche
Jacket material complies UL94V-0	Mantelmaterial UL94V-0
Tight bending radii	Enge Biegeradien
Compact design saves conduit space	Kompaktes Design, platzsparend
Specification for singlemode at ...nm, for multimode at ... nm	Spezifikationswerte für Single-mode bei ... nm, für Multimode bei ... nm

Multi-fiber loose tube	Bündeladerkabel
Loose tube cable	Hohladerkabel
Multifiber loose tube cable	Bündeladerkabel
Jelly-free	Gelfrei (trocken)
Metal-free outdoor cable	Metallfreies Aussenkabel
Metal-free indoor cable	Metallfreies Innenkabel
Longitudinal and transversal watertight cable design	Längs- und querwasserdichter Kabelaufbau
Good mechanical resistance	Gute mechanische Festigkeit
High chemical resistance against acids and alkaline solutions	Hohe chemische Beständigkeit gegen Säuren und Laugen
Jelly-free multifiber loose tube design	Trockener Bündeladeraufbau
Good stripping characteristics/properties	Gute Abisolierbarkeit
Installation directly in the ground and in mechanically unprotected environment	Für Verlegung direkt ins Erdreich und in mechanisch ungeschützter Umgebung
Rodant-protected	Nagetiergeschützt
Increased compressive strength	Erhöhte Querdruckfestigkeit
Self-extinguishing, low smoke and halogen-free	Selbstverlöschend, raucharm und halogenfrei
Roving armouring	Glasroving-Armierung
Steel armouring	Strahldraht-Armierung
Non-metallic armouring	Nichtmetallische Armierung
Plastic armouring (rodent protection)	Kunststoff-Armierung (Nagetierschutz)
No need for cleaning the fibers	Keine Reinigung der Fasern erforderlich
For vertical applications	Für vertikale Anwendungen
Easy stripping and installation	Einfache Abisolierbarkeit und Installation
Low fire load for high safety requirements	Geringe Brandlast für hohe Sicherheitsanforderungen

Technical terms English – German

Special terms	Spezialbegriffe
Standard cable	Standardkabel
PE-tube	PE-Röhrchen
Metal-free single-fiber cable	Metallfreies Einzelfaserkabel
Metal-free loose tube cable	Metallfreies, leeres Hohladerkabel
Metal-free multifiber loose tube cable	Metallfreies Bündeladerkabel
Not stranded multifiber loose tube cable	Unverseiltes Bündeladerkabel
Small fire load	Geringe Brandlast
Resistance against rodent attacks	Nagetiersicher
No contamination of installation material because of jelly	Keine Verschmutzung von Installationsmaterial durch Gel
Cleaning of the fiber not necessary (time saving)	Reinigung der Faser nicht notwendig (Zeitersparnis)
Mechanically resistant	Mechanisch widerstandsfähig
Tear off thread	Aufreissfaden

For technical data	Für Technische Daten
Tensile strength	Zugbeanspruchung
Minimum bending radius	Min. Biegeradius
Compressive strength	Querdruckfestigkeit
Short-term	Kurzzeitig
Long-term	Dauernd
Impact strength	Schlagfestigkeit
Repeated bending strength	Wechselbiegefestigkeit
Torsion strength	Torsionsfestigkeit
Coiling capability	Trommelbarkeit
Drag chain capability	Schleppkettentauglichkeit
Water tightness	Längswasserdichtheit
Temperature range	Temperaturbereich
Fire propagation	Brandfortleitung
Fire test with circuit integrity (CI)	Brandtest mit Funktionserhalt (FE)
Fire load	Brandlast
In service	In Betrieb
During installation	Bei Verlegung
On storage	Bei Lagerung
Cycles	Zyklen
Specifications for single-mode at ... nm, for multimode at ... nm	Spezifikationswerte für Single-mode bei ... nm, für Multimode bei ... nm

Glossary

AADSL	Asymmetric Digital Subscriber Line – at the moment the most commonly used communication technique for digital broadband transmission of Internet contents for end-users
Access Network	Sub network for customer access to a carrier network, up to 20 km (12 miles)
Access Node	Network point for the access transfer – usually built as central office including ODR's
APC	Angled Physical Contact is a angled polished endface (usually 8°), so that the reflected light is not travelling back in the fiber, but can escape sideways. Thereby an even lower back reflexion can be achieved as with UPC.
CCTV	Closed Circuit Television – describes a video surveillance system in industrial applications
CTB	Cable Termination Box
CPR	Construction Products Regulation
CWDM	Coarse Wavelength Division Multiplexing – various wavelengths are sent through the fiber at the same time. CWDM does not require the same network complexity as DWDM. CWDM is a cost-effective solution for metropolitan area and access networks. According to ITU proposal up to 18 channels can be used in the wavelength range from 1270 to 1610 nm.
DIN	German Institute of Standardisation
DMD	Differential Mode Delay
DSL, DSLx	Digital Subscriber Line – describes different techniques for transmitting data over two or four copper wires of the phone line, so called network termination, with high speed.
DSLAM	Digital Subscriber Line Access Multiplexer – part of required infrastructure for operation of DSL. DSLAM's are located at a place where all the lines of network terminations are connected.
DWDM	Dense Wavelength Division Multiplexing – WDM using a lot of different wavelength in a wavelength range with a small channel spacing. Commercial DWDM systems put 32 wavelength through one fiber, which corresponds, at a rate of 10 Gigabits/s per signal to a total rate of 320 Gigabits/s.
EFM	Ethernet in the First Mile – using the Ethernet protocol in the access network. The working group for EFM (standard IEEE 802.3ah) wants to replace ATM from the access network.
EN	European Standard
Ethernet	Ethernet for data transmission of 10Mb/s. It is the most widely-used data protocol for premises networks.
FT	Fiber Tray – a splice or distribution cassette with telescopic and hinged functionality holding fibers, splice connections and/or adapters. The FT has lateral fiber access to adapters called Side Access.
FTTB	Fiber-To-The-Building – network access with optical fibers to the building
FTTC	Fiber-To-The-Curb – network access with optical fibers to the curb
FTTD	Fiber-To-The-Desk – structured building cabling system (LAN) using optical fibers up to the workplace
FTTH	Fiber-To-The-Home – network access with optical fibers to the home
FTTO	Fiber-To-The-Office – structured building cabling system (LAN) using optical fibers up to the office
FTTP	Fiber-To-The-Premises – network access with optical fibers to the premises
Fiber	Optical fibers are dielectric waveguides which light is transmitted through the core. The cladding has a lower refractive index than the core. Thus the light is refracted at the boundary layer and is guided through the core. The fibers are made of silica (silica glass – pure silicon dioxide) or plastic (e.g. PMMA). The fiber is protected against mechanical damage and humidity with a special plastic coating. Today optical fibers are used to transmit data, to transmit power in the material processing, for illumination and reproduction purposes and in the measurement technique.

Glossary

FrontAccess	Access to fibers and adapters from the front of the rack, where usually a door is located
GPON	Gigabit-Capable Passive Optical Network
HCS	Hard Clad Silica are optical fibers with a step index profile and with a core made of common mineral glass and the cladding of a special plastic. A known fiber type has a core diameter of 200 µm and a cladding diameter of 230 µm. The fibers are used for short distances and in particular for industrial cabling.
HDTV	High Definition TeleVision – television with high resolution (16:9), 1920 × 1080 pixels
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. www.ieee.org
IP	Internet Protocol
IPxx	Describes the degree of protection by housings according IEC 60529 (DIN 40050). As protection the immersion of water and particles is specified and digits are assigned to it. The first digit describes the protection of particles with 0 to 6 and the second digit the protection against water with 0 to 8. For example IP67 describes the protection against particles with approx. 50 µm and against water maximal 1m below the surface for 30 minutes.
ITU	International Telecommunication Union
LAN	Local Area Network – for the transmission of information between independent terminal units
LSFH™	Low smoke and free of halogen are characteristics of material behaviour. LSFH™ is a Trademark of HUBER+SUHNER AG. Usually these materials are flame retardant and self-extinguishing, they are made of polyethylene and metalhydroxide additives. Similar abbreviations are LSOH and LSZH.
LWL	Optical wave guides, also called optical fibres, are dielectric wave guides which transmit light through their cores. The cladding surrounding the core has a lower index of refraction (density) than the core. This causes the light at the interface to be totally reflected and to be carried through the core of the optical wave guide. Optical wave guides are made of mineral glass (quartz glass – pure silicon dioxide) or plastic (especially PMMA), depending on the specific application. The cladding is surrounded by a protective layer to prevent mechanical damage. It is made of special plastic, which also protects the fibre against moisture. Today, optical wave guides are especially applied as a medium for transmitting data through optical fibres, for transmitting power in the field of material processing and in medicine, for lighting and imaging purposes and in metrology.
MAN	Metropolitan Area Network – Inter-regional network for the transmission of information
MPO	Multifiber push-on - an optical connector, standardised under IEC 61754-7:2008 (multimode only) which provides an interface for up to 72 fibers in a single unit, utilising individual rows of 12 fibers in a polymeric ferrule.
MTP®	Mechanical transfer push-pull – an enhanced version of the MPO connector offering higher optical performance, repeatability and reliability
Multimode	That is a fiber whose core diameter compared to the wavelength of the light is big. Typical core diameters are 50 µm (EU standard) and 62.5 µm (US standard). In the core a big number of waves can propagate. As a result of many paths signal interference occurs based on running time differences. Multimode fibers are suitable for data transmission over shorter distances.
NT	Network Termination – network termination with fiber or copper technique
NZDSF	Non-Zero Dispersion – Shifted Fiber
OAN	Optical Access Network – access network using optical fibers
PE	Polyethylene is made of ethene by polymerisation and a thermoplastic. Polyethylene is used for cable jackets, that have a high protection against environmental influences. The material is halogen-free and can be recycled without concern.

PCF	Polymer Cladded Fiber
PON	Passive Optical Network – an all optical network architecture without electrical/optical conversion and vice versa
PMD	Polarisation Mode Dispersion
POF	Plastic Optical Fiber/Polymer Optical Fiber
Primary coating	First buffer around the fiber protecting the fiber against humidity and mechanical stress; typically 250 µm
PUR	Polyurethanes are thermoplastics that are produced from a dialcohol and a polyisocyanate by polyaddition. Because of the excellent mechanical characteristics some polyurethane are suitable for application, where a high abrasive resistance, a high mechanical flexibility and a good fluid resistance are required.
Secondary coating	Second buffer around the fiber; typically 900 µm
Single-mode	The light travels through the fiber only in one wave, because the core diameter is small compared to the wavelength of the light (approx. 9 µm). Thus long distances and high data volume are possible with the fiber.
Splice	Permanent joint between 2 optical fibers ruptured in a plane, created by fusion, clamping or gluing
UL94	Is defined as a material test from Underwriters Laboratories Inc, (www.ul.com) testing inflammable material in regards to the fiber behaviour. Therefore after exposing a test rot to fire for 60 seconds the self-extinguishing behaviour is analyzed. V describes the test with a vertical test rod, whereas H is with a horizontally fixed rod. The behaviour of the vertical test is classified into 0, 1 or 2 with 0 showing the best self-extinguishing behaviour.
VDSL	Very High Speed Digital Subscriber Line – VDSL is the fastest of all DSL technologies. It allows a data transmission up to 52 Mbit/s over a phone line, though the usable transmission bandwidth declines with the length of the line. For the maximal speed the length may not exceed 300 m; with 900 m it reduces to half and with 1.4 km to a fourth. The speed of the data transmission enables to offer triple play via VDSL including television channels, internet and voice traffic. Planned application of VDSL is the transmission of HDTV, whereas also several channels can be transmitted simultaneously.
VoIP	Voice over IP – uses the internet to transport the voice
WAN	Wide Area Network – world-spanning network for the transmission of information (long-haul)
WDM	Wavelength Division Multiplexing – WDM using a lot of different wavelength in a wavelength range with a small channel spacing and transmitted through the same fiber simultaneously

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Waiver

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