Harsh Environment용 광케이블

Optical fibres

Harsh Environment용 광케이블_Optical fibres

Optical Single-mode Fibres

Fibre, single-mode - low water peak

2_1_20_2

According to ITU-T G.652 D (Low Water Peak)

Construction

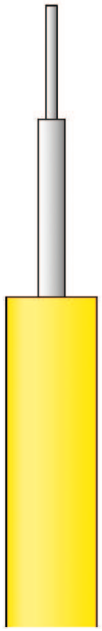
- Step index glass/glass optical fiber E9/125
- Primary coating with polyacrylate

Description

- The attenuation at 1383 nm is equal to the value at 1310 nm.

Standards

Please refer to data sheet "Used Standards 3_0_9"



Optical data (cabled)

Type	Attenuation dB/km 1310 nm	Attenuation dB/km 1550 nm	Chromatic dispersion ps/(nm x km) 1310 nm	Chromatic dispersion ps/(nm x km) 1550 nm	Zero dispersion wavelength nm	Cut-off wavelength nm	PMD ps/√km
FSLF	≤0.36	≤0.22	≤3.5	≤18	1302...1322	≤1260	≤0.2
FSL	≤0.36	≤0.25	≤3.5	≤18	1302...1322	≤1260	≤0.2
FSLA	≤0.40	≤0.25	≤3.5	≤18	1302...1322	≤1260	≤0.2

Geometric values

Type	Mode field ø µm 1310 nm	Mode field ø µm 1550 nm	Cladding Ø µm	Primary coating ø µm	Mode field non-circularity %	Cladding non-circularity %	MFD/cladding/-concentricity µm
FSLF	9.2±0.4	10.4±0.8	125±1	245±10	≤6	≤2	≤0.6
FSL	9.2±0.4	10.4±0.8	125±1	245±10	≤6	≤2	≤0.6
FSLA	9.2±0.4	10.4±0.8	125±1	245±10	≤6	≤2	≤0.6

These values correspond to following standards

Type	DIN VDE 0888	IEC 60793	ITU-T G.652
FSLF	x	x	x
FSL	x	x	x
FSLA	x	x	x

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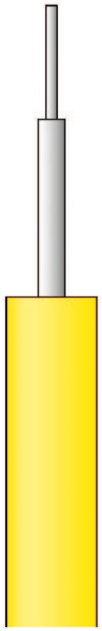
Fibre, single-mode - bend optimized

2_1_21

According to ITU-T G.657 A1



Construction

- Step index glass/glass optical fiber
- Primary coating with polyacrylate

Description

- The attenuation at 1383 nm is equal to the value at 1310 nm.

Standards

These fibers are compatible with fibers corresponding to ITU-T G.652 D

On request other bend optimized fibers are available

Remarks

Available on request

Optical data (cabled)

Type	Attenuation dB/km 1310 nm	Attenuation dB/km 1550 nm	Chromatic dispersion ps/(nm x km) 1310 nm	Chromatic dispersion ps/(nm x km) 1550 nm	Zero dispersion wavelength nm	Cut-off wavelength nm	PMD ps/√km
FSB	≤0.36	≤0.25	≤3.5	≤18	1304...1324	≤1260	≤0.2

Geometric values

Type	Mode field ø µm 1310 nm	Mode field ø µm 1550 nm	Cladding Ø µm	Primary coating ø µm	Mode field non-circularity %	Cladding non-circularity %	MFD/cladding/-concentricity µm
FSB	8.6±0.4	9.8±0.5	125±1	245±10	≤6	≤2	≤0.8

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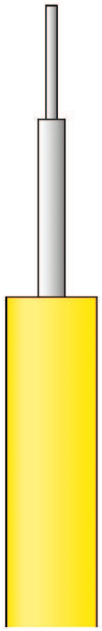
Fibre, single-mode - NZDSF

2_1_23

NZDSF Non Zero Dispertion Shifted Fibre, according to ITU-T G.655 C



Construction

- Glass/glass optical fiber
- Primary coating with polyacrylate

Standards

Please refer to data sheet "Used Standards 3_0_9"

Optical data (cabled)

Type	Attenuation dB/km 1550 nm	Attenuation dB/km 1625 nm	Chromatic dispersion ps/(nm x km) C-band	Chromatic dispersion ps/(nm x km) L-band	Increase of dispersion ps/(nm² x km) 1550 nm	Cut-off wavelength nm	PMD ps/√km	Effect. area (Aeff) µm2
LEAF®	≤0.30	≤0.35	2.0-6.0	4.5-11.2	0.100	≤1360	≤0.2	72
FutureGuide™	≤0.30	≤0.35	2.0-6.0	4.5-11.2	0.100	≤1450	≤0.2	72
TrueWave®RS	≤0.30	≤0.35	2.6-6.0	4.0-8.9	0.045	≤1260	≤0.2	52
TeraLight™	≤0.30	≤0.35	5.5-10.0	7.5-13.8	0.052	≤1300	≤0.2	63

Geometric values

Type	Mode field ø µm 1550 nm	Cladding Ø µm	Primary coating ø µm	Cladding non-circularity %	MFD/cladding/concentricity µm
LEAF®	9.6±0.4	125±1	242±5	≤1.0	≤12
FutureGuide™	9.6±0.4	125±1	245±5	≤1.0	≤12
TrueWave®RS	8.4±0.6	125±1	242±5	≤0.7	≤10
TeraLight™	9.2±0.5	125±1	242±7	≤1.0	≤12

These values correspond to following standards

Type	IEC 60793	ITU-T G.655
LEAF®	x	x
FutureGuide™	x	x
TrueWave®RS	x	x
TeraLight™	x	x

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Optical Multimode Fibres

Fibre, multimode

2_1_32

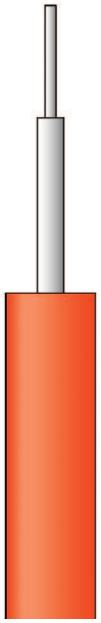
Optimised for standard and 10 Gigabit Ethernet application

Construction

- Graded index glass/glass optical fibre
- Primary coating with polyacrylate

Standards

Please refer to data sheet "Used Standards 3_0_9"



Optical data (cabled)

Type	Attenuation dB/km 850 nm	Attenuation dB/km 1300 nm	Bandwidth/-length product MHz x km (OFL) 850 nm	Bandwidth/-length product MHz x km (OFL) 1300 nm	Bandwidth/-length product MHz x km (LASER) 850 nm	Numeric aperture	DMD characteristics
FG6 - OM1	≤3.5	≤1.0	≥200	≥500	-	0.275±0.02	TIA-492AAAA
FG5 - OM2	≤2.7	≤0.9	≥500	≥500	≥950	0.200±0.02	TIA-492AAAB
FG5M - OM3	≤2.7	≤0.9	≥1500	≥500	≥2000	0.200±0.02	TIA-492AAAC
FG5N - OM4	≤2.7	≤0.9	≥3500	≥500	≥4700	0.200±0.02	TIA-492AAAD

Geometric values

Type	Core Ø µm	Cladding Ø µm	Primary coating ø µm	Core non-circularity %	Cladding non-circularity %	Core/sheath concentricity µm
FG6 - OM1	62.5±2.5	125±1.0	245±10	≤5	≤1	≤1.5
FG5 - OM2	50±2.5	125±1.0	245±10	≤5	≤1	≤1.5
FG5M - OM3	50±2.5	125±1.0	245±10	≤5	≤1	≤1.5
FG5N - OM4	50±2.5	125±1.0	245±10	≤5	≤1	≤1.5

These values correspond to following standards

Type	ITU-T G.651 (50/125µm)	DIN VDE 0888	EN 50173	ISO / IEC 11801	IEC 60793	IEEE 802.3ae
FG6 - OM1			x	x	x	
FG5 - OM2	x	x	x	x	x	
FG5M - OM3	x	x	x	x	x	x
FG5N - OM4	x	x	x	x	x	x

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Metallic fibre optic cables

Metallic Fibre Optic Overhead Cables

BRUtelecom

3_6_1

LLK-TSnCd

Metallic aerial fibre optic rope with optical fibres in stranded stainless steel loose tubes

Construction

- Galvanised steel wires
- Gel-filled stainless steel loose tubes
- Optical fibres with primary coating

Description

- Stranded stainless steel loose tubes
- Compact design
- High corrosion resistance
- High mechanical strength
- Connectable with standard dead-ends and suspension fittings

Application

- Mountain cableways
- Communication networks
- Industry

Temperature range

Operating temperature: -40° ... +80°C
Storage temperature: -40° ... +80°C
Installation temperature: -5° ... +50°C

Standards

IEC 60794 Optical fibre cables
Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Identification of loose tubes by colour coded threads.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Other types on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Permanent tension N/mm²	Theor. breaking load kN
7 mm	12	7.0	≤242	1100	≥44
10 mm	24	10.0	≤476	1100	≥89
12 mm	60	12.5	≤734	1100	≥139
16 mm	108	16.0	≤1192	1100	≥227
19 mm	60	18.3	≤1592	1100	≥326

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm
7 mm	20xD	15xD
10 mm	20xD	15xD
12 mm	20xD	15xD
16 mm	20xD	15xD
19 mm	20xD	15xD

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BRUtelecom Energy

3_6_3

LLK-TSKnCd

Metallic aerial fibre optic rope with optical fibres in a stainless steel loose tube stranded with insulated copper conductors for low voltage power supply

Construction

- Galvanised steel wires
- PE polyethylene sheath
- EPR insulated copper conductors 4x10mm^2 (3LPE, class 1)
  Operating voltage U_0/U 600V/1000VAC max.
- EPR insulated and gel-filled stainless steel loose tube
- Optical fibres with primary coating

Description

- Self supporting
- Compact design
- High corrosion resistance
- High mechanical strength
- Halogen free

Application

- Power supply in remote areas
- Video transmission with power supply for cameras
- Mountain cableways
- Communication networks

Temperature range

Operating temperature: -40° ... +80°C
Storage temperature: -40° ... +80°C
Installation temperature: -5° ... +50°C

Standards

Conductors based on HD 603, parte 7, section E
IEC 60794 Optical fibre cables
Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Other types on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Permanent tension N/mm²	Theor. breaking load kN
29 mm	48	29.2	3190	1100	514

Type	No of copper conductors	Conductor cross-section mm²	Min. bending radius with tensile mm	Min. bending radius without tensile mm
29 mm	4	10.00	20xD	15xD

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BRUtelecom Data

3_6_2

LLK-TSnCd

Metallic aerial rope for signal transmission with insulated copper conductors in the outer layer and protected optical fibres in the cable core. The copper conductors are accessible on the rope track. (patent pending)

Construction

- Galvanised steel wires
- Insulated copper conductors
- Adhesive compound
- Gel-filled stainless steel loose tubes
- Optical fibres with primary coating

Description

- Self supporting
- Insulated copper conductors in the outer layer
- Stranded stainless steel loose tubes
- Compact design
- High corrosion resistance
- High mechanical strength
- UV resistant
- Connectable with standard dead-ends and suspension fittings

Application

- Mountain cableways
- Communication networks
- Industry

Temperature range

Operating temperature: -40° ... +80°C
Storage temperature: -40° ... +80°C
Installation temperature: -5° ... +50°C

Standards

IEC 60794 Optical fibre cables
Additional Information see "Used standards" 3_0_9

Labeling

Max. 6 insulated copper conductors, numbered.

Remarks

The copper conductors are qualified for electrical signal transmission up to 50V.
This cable is available with different fibre types, see data sheets Optical Fibres.
Identification of loose tubes by colour coded threads.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Other types on request

Technical data

Type	No of fibres (max.)	Conductor cross-section mm²	Cable ø mm	Weight kg/km
12 mm	60	1.0	12.5	612.0
14 mm	72	1.5	14.5	820.0

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Permanent tension N/mm²	Theor. breaking load kN
12 mm	20xD	15xD	1339	max. 134
14 mm	20xD	15xD	1339	max. 181

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BRUair®

3_12_1

Self-supporting aerial cable with fibre optics in fig. -8 arrangement with a metallic support strand

Construction

- PE outer sheath
- Galvanized steel strand
- Glass yarn
- Gel-filled loose tube
- Optical fibres with primary coating

Description

- Loose tube with up to 24 fibres
- High permissible tensile strength
- One sheath around steel strand and loose tube with fibre optics
- Construction for easy installation
- Metallic bearing and fibre optics can easily be separated for fibre optic handling
- Robust sheath
- Halogen-free, UV resistant cable sheath
- Insensitive against environmental influences such as wind, rain, snow, ice and solar radiation

Application

- Self-supporting applications
- For spans up to 100 meters

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +40°C

Jacket colour

Black similar to RAL 9005
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Accessories & Fittings for BRUair are available on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D25	12	10.5 x 5.0	65	*)	*)
1D30	24	11.0 x 5.5	70	*)	*)

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Breaking load N
1D25	20xD	15xD	6800
1D30	20xD	15xD	6800

*) Depending on installation details, to be clarified

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Metallic Fibre Optic Underwater Cables

BRUaqua®

3_7_1

LLK-SSnCd(F2YD)

Metallic underwater cable with optical fibres in one central or in several stranded stainless steel loose tubes.
Interstices filled with moisture-blocking compound, outer sheath in HDPE.

Construction

- PE outer sheath
- Moisture barrier (compound)
- Galvanised steel wires
- Gel-filled stainless steel loose tubes
- Optical fibres with primary coating

Description

- One central or several stranded stainless steel loose tubes
- Compact design
- High corrosion resistance
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Excellent rodent protection
- Robust sheath
- Halogen-free cable sheath

Application

- Laying directly in water and in chemically aggressive environments

Temperature range

Operating temperature: -40° ... +60°C
Storage temperature: -40° ... +60°C
Installation temperature: -5° ... +50°C

Jacket colour

Black similar to RAL 9005

Standards

IEC 60794 Optical fibre cables
Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Identification of loose tubes by colour coded threads.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Other types on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight in water kg/km	Theor. breaking load kN
16 mm	60	16.7	≥561	≥139
20 mm	108	20.2	≥889	≥227
22 mm	144	22.4	≥1161	≥296

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
16 mm	20xD	15xD	2000
20 mm	20xD	15xD	2000
22 mm	20xD	15xD	2000

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BRUduct®

3_7_5

LLK-lSnPd

Metallic underwater cable with minitubes to blow in non-metallic fibre optic cables. Excellent properties for installation in existing facilities.

Construction

- Very robust and resistant outer sheath
- Amroured with aluminium alloy wires and/or galvanized steel wires

Description

- Compact design
- High corrosion resistance
- High permissible tensile strength
- Watertight
- Excellent rodent protection
- Robust sheath
- Halogen-free cable sheath

Application

- Underwater installations
- Use in chemically aggressive environments
- Installation in existing systems such as sewer systems, rainwater pipes etc.

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +40°C

Jacket colour

Black similar to RAL 9005

Remarks

For suitable non-metallic fibre optic cables please refer to data sheets "BRUclean Mini" and "BRUclean Micro".
Other types on request

Technical data

Type	Minitubes outer-ø[1] mm	Recommended cable ø mm	Cable ø mm	Cable weight (approx.) kg/km	Max. Installationd force kN
3 Minitubes	12	3 - 8	39.3	2769	40
6 Minitubes	12	3 - 8	52.5	4141	40

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
3 Minitubes	20xD	15xD	300
6 Minitubes	20xD	15xD	300

[1] Tube wall thickness 1.1 mm

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Metallic Fibre Optic Ground Cables

BRUsteel

3_7_4

LLK-BST

Flexible mini fibre optic cable - armoured, with stainless steel loose tubes with up to 8 fibres, metal strength members and outer sheath.

Construction

- Polyamide PA outer sheath
- Steel wires
- Gel-filled steel loose tube
- Optical fibres with primary coating

Description

- Central steel loose tube
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Excellent rodent protection
- Compact design, high flexibility
- Low weight
- Robust sheath
- Halogen-free cable sheath
- Connected with standard dead-ends and suspension fittings

Application

- Indoors, indoors and outdoors, outdoors
- Broadcast, FTTH and sensing applications
- Temporary applications
- Self-supporting applications

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -5° ... +50°C

Jacket colour

Blue similar to RAL 5005
Other colours on request

Standards

IEC 60794 Optical fibre cables
Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Special labelling of outer sheath on request

- Accessories (on request):
  - Pre-assembled cables with:
    - Standard ferrule connector
    - Connector with IP protection class
  - Dead-ends
  - Repair kit

Fibre and tube colours see "Colour codes/ properties" 3_0_3.

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1F	1	3.4	18	1000	750
2F	2	3.8	25	1500	1100
4F	4	3.8	25	1300	900
8F	8	4.8	46	3500	2600

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1F	20xD	15xD	2000
2F	20xD	15xD	960
4F	20xD	15xD	800
8F	20xD	15xD	1000

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Non-metallic fibre optic cables

Fibre optic indoor / outdoor calbes

BRUniversal 150

3_9_1

Universal fibre optic cable with central loose tube Longitudinally watertight in combination with a halogen-free and flame-retardant sheath

Construction

- FRNC outer sheath
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- Longitudinally and laterally watertight
- Rodent protection
- Compact design, high flexibility, small bending radius
- Robust sheath
- Halogen-free and flame-retardant cable sheath

Application

- Indoors and outdoors

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -20° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Green similar to RAL 6018
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Eca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QGH)
J/A-DQ(ZN)BH

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N	Combustion energy MJ/m
1D25	12	8.5	65	2000	1500	1.0
1D30	24	8.8	70	2000	1500	1.4

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	200

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BRUniversal 250

3_9_2

Universal fibre optic cable with central loose tube Longitudinally watertight in combination with a halogen-free and flame-retardant sheath

Construction

- FRNC outer sheath
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Compact design, high flexibility, small bending radiuses
- Robust sheath
- Halogen-free and flame-retardant cable sheath

Application

- Indoors and outdoors

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -20° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Green similar to RAL 6018
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(Q2GH)
J/A-DQ(ZN)BH

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N	Combustion energy MJ/m
1D25	12	9.8	120	3000	2500	1.1
1D30	24	10.1	130	3000	2500	1.5

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	300

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BRUniversal 300

3_9_3_1

LLK-SGnD(QGH)
J/A-DQ(ZN)BH

Universal fibre optic cable with stranded loose tubes
Longitudinally watertight in combination with a halogen-free and flame-retardant sheath

Construction

- FRNC outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Suitable for blowing into pipe systems
- Rodent protection
- Compact design, high flexibility
- Robust sheath
- Halogen-free and flame-retardant cable sheath

Application

- Indoors and outdoors

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Green similar to RAL 6018
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N	Combustion energy MJ/m
SG 5D25	60	12.1	150	5000	3000	2.3
SG 6D25	72	12.7	175	5000	3000	3.2
SG 8D25	96	14.4	210	5000	3000	4.1
SG 10D25	120	15.9	250	5000	3000	5.0
SG 12D25	144	17.5	330	5000	3000	6.0

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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BRUniversal 600

3_9_5_1

LLK-SGnD(Q1.5GH)
J/A-DQ(ZN)BH

Universal fibre optic cable with stranded loose tubes
Longitudinally watertight in combination with a halogen-free and flame-retardant sheath

Construction

- FRNC outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Suitable for blowing into pipe systems
- Enhanced rodent protection
- Compact design, high flexibility
- Robust sheath
- Halogen-free and flame-retardant cable sheath

Application

- Indoors and outdoors

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Green similar to RAL 6018
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N	Combustion energy MJ/m
SG 5D25	60	13.0	180	8000	6000	3.0
SG 6D25	72	13.5	200	8000	6000	3.3
SG 8D25	96	14.9	240	8000	6000	4.2
SG 10D25	120	16.5	300	8000	6000	5.1
SG 12D25	144	19.7	380	8000	6000	6.1

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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BRUniversal 900

3_9_4_1

LLK-SGnD(Q2GH)
J/A-DQ(ZN)BH

Universal fibre optic cable with stranded loose tube
Longitudinally watertight in combination with a halogen-free and flame-retardant sheath

Construction

- FRNC outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Suitable for blowing into pipe systems
- Enhanced rodent protection
- Compact design, high flexibility
- Robust sheath
- Halogen-free and flame-retardant cable sheath

Application

- Indoors and outdoors

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Green similar to RAL 6018
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N	Combustion energy MJ/m
SG 5D25	60	13.8	210	11000	9000	3.1
SG 6D25	72	14.3	230	11000	9000	3.4
SG 8D25	96	15.6	270	11000	9000	4.3
SG 10D25	120	17.1	350	11000	9000	5.2
SG 12D25	144	20.2	430	11000	9000	6.2

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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Fibre optic outdoor cables

BRUclean® micro

3_2_51

LLK-SGnD(Q2YD)
A-DQ(ZN)2Y

Very compact fibre optic cable with stranded loose tubes

Construction

- PE outer sheath
- Ripcord
- Gel-filled loose tubes
- Fibres with primary coating
- FRP central strength member

Description

- Stranded loose tubes with up to 144 fibres
- Compact design
- High flexibility
- Longitudinally watertight
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- FTTH
- Blowing into microtubes

Temperature range

Operating temperature: -20° ... +70°C
Storage temperature: -20° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Fibres according ITU-T Rec. G.652D, option G.657A.
Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

Fibre and loose tube colours see colour codes/properties 3_0_3

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 6D15	24 (2x12)	5.8	28	500	100
SG 6D15	48 (4x12)	5.8	28	500	100
SG 6D15	72 (6x12)	5.8	28	500	100
SG 8D15	96 (8x12)	6.7	41	500	100
SG 12D15	144 (12x12)	8.6	64	1000	200

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 6D15	20xD	15xD	50
SG 8D15	20xD	15xD	50
SG 12D15	20xD	15xD	50

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BRUclean® micro 200

3_2_52

Very compact fibre optic cable with stranded loose tubes

Construction

- PE outer sheath
- Ripcord
- Gel-filled loose tubes
- Fibres with primary coating
- FRP central strength member

Description

- Stranded loose tubes with up to 288 fibres
- Compact design
- High flexibility
- Longitudinally watertight
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- FTTH
- Blowing into microtubes

Temperature range

Operating temperature: -20° ... +70°C
Storage temperature: -20° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black similar to RAL 9005
Other colours on request

Standards

This cable is only available with fibres acc. ITU-T-Rec. G.657A with 200 µm coating diameter.
Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

Fibre and loose tube colours acc. to DIN/VDE
Construction with 216 fibers is black, orange stripes, fiber color code acc. 3_0_3

LLK-SGnD(Q2YD)
A-DQ(ZN(2Y)

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 8D17	192 (8x24)	7.5	56	700	150
SG 9D17	216 (9x24)	7.7	55	1000	200
SG 8D19	288 (8x36)	8.1	70	1000	200

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 8D17	20xD	15xD	50
SG 9D17	20xD	15xD	50
SG 8D19	20xD	15xD	50

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BRUclean® micro PA 200

3_2_53

Very compact fibre optic cable with stranded loose tubes

Construction

- PA outer sheath
- Ripcord
- Gel-filled loose tubes
- Fibres with primary coating
- FRP central strength member

Description

- Stranded loose tubes with 144 fibres
- Compact design
- High flexibility
- Longitudinally watertight
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- FTTH
- Blowing into microtubes

Temperature range

Operating temperature: -20° ... +70°C
Storage temperature: -20° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

This cable is only available with fibres acc. ITU-T-Rec. G.657A with 200 µm coating diameter. Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

Fibre and loose tube colours see colour codes/properties 3_0_3

LLK-SGnD(Q4Y)
A-DQ(ZN)4Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 6D17	144 (6x24)	6.3	36	700	150

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 6D17	20xD	15xD	50

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BRUclean® mini, central

3_2_41

Fibre optic mini cable with central loose tube
Non-metallic aramide yarn strength members

Construction

- PE outer sheath
- 2 Ripcords
- Kevlar yarn
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- Compact design
- High flexibility, small bending radius
- Longitudinally watertight
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- FTTH

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -25° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QK2YD)
A-DQ(ZN)B2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D30	12	4.7	21	600	600
1D30	24	4.7	21	600	600

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D30	20xD	15xD	150
1D30	20xD	15xD	150

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BRUclean® mini, stranded

3_2_42

Fibre optic mini cable with stranded loose tubes
Non-metallic aramide yarn strength members

Construction

- PE outer sheath
- 2 Ripcords
- Kevlar yarn
- Gel-filled loose tubes
- Fibres with primary coating
- FRP central strength member

Description

- Up to 12 stranded loose tubes with up to 144 fibres
- Compact design
- High flexibility
- Longitudinally watertight
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- FTTH

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -25° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QK2YD)
A-DQ(ZN)2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 6D18	72	6.6	33	1000	1000
SG 8D18	96	7.6	45	1000	1000
SG 12D18	144	10.6	80	1000	1000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 6D18	20xD	15xD	150
SG 8D18	20xD	15xD	150
SG 12D18	20xD	15xD	150

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BRUclean® 150

3_2_1

Fibre optic cable with central loose tube
Non-metallic glass yarn strength members

Construction

- PE outer sheath
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- Longitudinally and laterally watertight
- Rodent protection
- Compact design, high flexibility, small bending radius
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QG2YD)
A-DQ(ZN)B2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D25	12	7.5	60	2000	1500
1D30	24	7.8	65	2000	1500

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	200

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BRUclean® 250

3_2_2

Fibre optic cable with central strength loose tube
Non-metallic glass yarn strength members

LLK-D(Q2G2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Compact design, high flexibility, small bending radiuses
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D25	12	9.6	90	3000	2500
1D30	24	9.9	100	3000	2500

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	300

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BRUclean® 300

3_2_3_1

Fibre optic cable with stranded loose tubes
Non-metallic glass yarn strength members

LLK-SGnD(QG2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D25	60	11.9	115	5000	3000
SG 6D25	72	12.5	135	5000	3000
SG 8D25	96	14.0	175	5000	3000
SG 10D25	120	15.7	210	5000	3000
SG 12D25	144	17.3	250	5000	3000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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BRUclean® 600

3_2_5_1

Fibre optic cable with stranded loose tubes
Non-metallic glass yarn strength members

LLK-SGnD(Q1.5G2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D25	60	12.8	135	8000	6000
SG 6D25	72	13.3	155	8000	6000
SG 8D25	96	14.7	190	8000	6000
SG 10D25	120	16.3	225	8000	6000
SG 12D25	144	17.9	270	8000	6000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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BRUclean® 900 12x12

3_2_4_1

Fibre optic cable with stranded loose tubes
Non-metallic glass yarn strength members

LLK-SGnD(Q2G2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 144 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D25	60	13.6	190	11000	9000
SG 6D25	72	14.1	210	11000	9000
SG 8D25	96	15.4	230	11000	9000
SG 10D25	120	16.9	250	11000	9000
SG 12D25	144	18.4	300	11000	9000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	300
SG 6D25	20xD	15xD	300
SG 8D25	20xD	15xD	300
SG 10D25	20xD	15xD	300
SG 12D25	20xD	15xD	300

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BRUclean® 900 12x24

3_2_4_2

Fibre optic cable with stranded loose tubes
Non-metallic glass yarn strength members

LLK-SGnD(Q2G2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- FRP central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D30	120	14.5	210	11000	9000
SG 6D30	144	15.3	230	11000	9000
SG 8D30	192	16.7	250	11000	9000
SG 10D30	240	18.4	280	11000	9000
SG 12D30	288	20.5	330	11000	9000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D30	20xD	15xD	300
SG 6D30	20xD	15xD	300
SG 8D30	20xD	15xD	300
SG 10D30	20xD	15xD	300
SG 12D30	20xD	15xD	300

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BRUclean® 900 Jumbo

3_2_9

Fibre optic cable with stranded loose tubes
Non metallic glass yarn strength members

LLK-SG18D(Q2G2YD)
A-DQ(ZN)B2Y

Construction

- PE outer sheath
- Glass yarns
- Water-blocking tape
- 1st layer gel-filled loose tubes
- Fibres with primary coating
- 2nd layer gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 18 stranded loose tubes with up to 432 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -10° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 18D25	216	18.4	340	11000	9000
SG 18D30	432	20.6	370	11000	9000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 18D25	20xD	15xD	300
SG 18D30	20xD	15xD	300

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BRUclean® 150+W, corrugated

3_4_6

Fibre optic cable with central loose tube - armoured
Glass yarn strength members, corrugated steel tape for chemical resistance

Construction

- PE outer sheath
- Corrugated steel tape
- PE inner sheath
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- Longitudinally and laterally watertight
- Excellent rodent protection
- Compact design, high flexibility
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QG2YDW2YD)
A-DQ(ZN)B2YW2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D25	12	13.2	180	2000	1500
1D30	24	13.2	185	2000	1500

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	300

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BRUclean® 300+W, corrugated

3_4_7_1

Fibre optic cable with stranded loose tubes - armoured
Glass yarn strength members, corrugated steel tape for higher mechanical and chemical resistance

Construction

- PE outer sheath
- Corrugated steel tape
- PE inner sheath
- Glass yarns
- Water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 240 fibres
- High permissible tensile strength
- Very high crush resistance
- Longitudinally and laterally watertight
- Excellent rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-SGnD(QG2YDW2YD)
A-DQ(ZN)B2YW2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D25	60	16.8	300	7100	5700
SG 6D25	72	17.8	320	7100	5700
SG 8D25	96	19.9	360	7100	5700
SG 10D25	120	22.4	410	7100	5700
SG 12D25	144	22.4	470	7100	5700

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	450
SG 6D25	20xD	15xD	450
SG 8D25	20xD	15xD	450
SG 10D25	20xD	15xD	450
SG 12D25	20xD	15xD	450

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BRUclean® 150W, corrugated

3_4_8

Fibre optic cable with central loose tube - armoured
Glass yarn strength members, corrugated steel tape for higher mechanical and chemical resistance

Construction

- PE outer sheath
- Corrugated steel tape
- Glass yarns with water-blocking tape
- Gel-filled loose tube
- Fibres with primary coating

Description

- Central loose tube with up to 24 fibres
- High permissible tensile strength
- Longitudinally and laterally watertight
- Excellent rodent protection
- Compact design, high flexibility
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -20° ... +60°C
Storage temperature: -40° ... +70°C
Installation temperature: ±0° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

LLK-D(QGW2YD)
A-DQ(ZN)BW2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1D25	12	9.8	85	2000	1500
1D30	24	9.8	95	2000	1500

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
1D25	20xD	15xD	300
1D30	20xD	15xD	300

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BRUclean® 300W, corrugated

3_4_9_1

LLK-SGnD(QGW2YD)
A-DQ(ZN)BW2Y

Fibre optic cable with stranded loose tubes - armoured
Glass yarn strength members, corrugated steel tape for higher mechanical and chemical resistance

Construction

- PE outer sheath
- Corrugated steel tape
- Glass yarns
- Water-blocking tape
- Gel-filled loose tube
- Water-blocking tape
- Fibres with primary coating
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 288 fibres
- High permissible tensile strength
- Very high crush resistance
- Longitudinally and laterally watertight
- Excellent rodent protection
- Grease-free cable core
- Robust sheath
- Halogen-free cable sheath
- Suitable for blowing into pipe systems

Application

- Outdoors
- Laying directly in the ground

Temperature range

Operating temperature: -40° ... +70°C
Storage temperature: -40° ... +70°C
Installation temperature: -5° ... +50°C

Jacket colour

Black with orange stripes similar to RAL 9005/2003
Other colours on request

Standards

Additional Information see "Used standards" 3_0_9
CPR fire reaction class Fca

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Special labelling of outer sheath on request

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
SG 5D25	60	13.8	210	5000	3000
SG 6D25	72	14.8	230	5000	3000
SG 8D25	96	16.9	270	5000	3000
SG 10D25	120	17.8	320	5000	3000
SG 12D25	144	19.9	380	5000	3000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm
SG 5D25	20xD	15xD	400
SG 6D25	20xD	15xD	400
SG 8D25	20xD	15xD	400
SG 10D25	20xD	15xD	400
SG 12D25	20xD	15xD	400

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ADSS Aerial Cable

3_5_3_1

All-dielectric self-supporting aerial cable with stranded loose tubes
Aerial cable with non-metallic strength members of treated glass yarns

Construction

- PE outer sheath
- Glass yarn, treated
- Water-blocking tape
- Gel-filled loose tubes
- Fibres with primary coating
- Water-blocking tape
- GFK central strength member

Description

- Up to 12 stranded loose tubes with up to 144 fibres
- High permissible tensile strength
- High crush resistance
- Longitudinally and laterally watertight
- Enhanced rodent protection
- High bullet resistance
- Grease-free cable core
- Robust sheath
- Halogen-free, UV resistant cable sheath
- Insensitive against environmental influences such as wind, rain, snow, ice and solar radiation
- Connected with standard dead-ends and suspension fittings

Application

- Outdoors
- Self-supporting applications
- Within electric fields (E < 12 kV/m)

Temperature range

Operating temperature: -40° ... +75°C
Storage temperature: -40° ... +75°C
Installation temperature: ±0° ... +50°C

Jacket colour

Black similar to RAL 9005
Other colours on request

Standards

EIA/TIA 455
IEEE P1222
Additional Information see "Used standards" 3_0_9

Remarks

This cable is available with different fibre types, see data sheets Optical Fibres.
Fibre and tube colours see "Colour codes/ properties" 3_0_3.
Thermal expansion coefficient: 4.8 x 10^{-6} x 1/°C
Special labelling of outer sheath on request

LLK-SGnD(Q2VG2YD)
A-DQ(ZN)B2Y

Technical data

Type	No of fibres (max.)	Cable ø mm	Weight kg/km	Max. tensile strength Service (MRCL) N	Max. tensile strength without fibre strain N
SG 5D25	60	14.9	190	13800	5000
SG 6D25	72	15.6	220	17000	6500
SG 8D25	96	17.2	265	20000	8000
SG 10D25	120	18.8	320	22500	9000
SG 12D25	144	20.6	380	25000	10000

Type	Min. bending radius with tensile mm	Min. bending radius without tensile mm	Max. crush resistance N/cm	Breaking load N	Safety factor[1]
SG 5D25	20xD	15xD	400	32000	2.3
SG 6D25	20xD	15xD	400	38000	2.2
SG 8D25	20xD	15xD	400	41000	2.1
SG 10D25	20xD	15xD	400	45000	2.0
SG 12D25	20xD	15xD	400	50000	2.0

[1] For crush resistance and tensile strength in operating

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