Fischer FiberOptic Series

Cable Specifications

Connect²

Expertise | Reliability | Innovation

Robust Optical Performance

Fiber optic & fiber optic hybrid solutions

www.fischerconnectors.com

fischer® CONNECTORS

INTRODUCTION

Fischer FiberOptic push-pull connector solutions are purpose built to withstand the elements of rugged and harsh environments, providing virtually faultless optical performance. This rugged product line comes pre-cabled to save you time and money without compromise.

This brochure is an overview of current high performance cables Fischer Connectors is offering in cooperation with its global solution provider for its Fischer FiberOptic Series. We have chosen high performance cables to maintain a high standard quality manufacturing process. Other cable solutions are available on request.

Fischer FiberOptic Series can be used in a wide range of fields requiring faultless quality indoor, outdoor or for demanding applications, such as Transport, Telecom, Energy, Fiber Sensing, Defense & Security, Broadcast, Civil Construction or Medical Devices.

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PRODUCT **AVAILABILITY**

CHOOSE YOUR CABLE

INDOOR/OUTDOOR

Supplier Brand	Fiber Count	SM 9/125 G.657.A1	MM 50/125 OM3	MM 62.5/125 OM1+	
OCC	2	☐	☐	☐	
	4	☐	☐	☐	
LEONI	2	☐	■	■	
	4	☐	■	■	
LEONI	Hybrid 2+2	☐	☐	■	

RODENT PROOF

Supplier Brand	Fiber Count	SM 9/125 G.657.A1	MM 50/125 OM3	MM 62.5/125 OM1+	
LEONI Glass Fiber	2	☐	☐	■	
	4	☐	☐	■	
BRUGG Metal Armored	2	☐	■	■	
	4	☐	■	■	

☐ *Available* ■ *Available under special lead time - please contact your local sales departement for details*

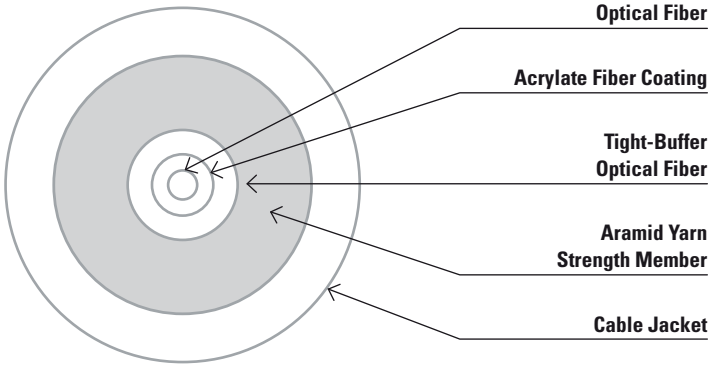
Features	OCC	LEONI	LEONI	BRUGG
Best for	**Premium application**	**High Load application**	**Rodent proof**	**Metal Armored**
	- Overall ruggedness - Easy deployment - High end tactical cable	- High load resistance - Easy deployment - High end tactical cable	- Semi-static applications - Easy deployment - Dielectric rodent protection - High flexibility	- High rodent protection - Static & deployable applications - Self supporting applications - Ultra-light armored technology - Direct burial
Technology	-Tight buffered fibers - Aramid yarn - PUR jacket	-Tight buffered fibers - Aramid yarn - PUR jacket	-Tight buffered fibers - Aramid yarn - Fiber glass - PUR double skin jacket	-Stainless steel loose tube - Stainless steel yarn - PA Jacket
Outer Diameter	5.5 mm	5.5 mm	9.4 mm	3.8 mm
Weight	27 kg/km	28 kg/km	105 kg/km	25 kg/km
Operation tensile load* (long term)	600 N	1500 N	2000 N	900 N
Crush resistance	1800 N/cm	800 N/cm	800 N/cm	800 N/cm
Min. Bending radius	3.3 cm	5.5 cm	9.4 cm	5.7 cm
Operating Temperature	-40°C to +85°C	-55°C to +85°C	-55°C to +85°C	-40°C to + 70°C

**Applies to cable only.*

OCC **1 CHANNEL**

A-Series Micro Assembly
LSZH Cables
(2.0mm & 1.6mm)

Part #: AE001ZSLA9YZ



Laser Ultra-Fox™ Fiber Performance

Fiber Code	SLA
Industry Standard Designation	Low Water Peak Single Mode ITU-T G.657.A1 and ITU-T G.652.D
Core/Cladding Diameter (µm)	9/125
Wavelength (nm)	1310/1550
Maximum Cabled Attenuation (dB/km)	0.5/0.5
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Zero Dispersion Slope (ps/nm2-km)	0.092
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	300 N (67 lbs)	160 N (36 lbs)
Min Bend Radius	3.8 cm (1.5 in)	2.5 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	200 Impacts
Crush Resistance TIA/EIA-455-41A	500 N/cm
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +70°C
Installation Temperature (actual temp. of cable)	0°C to +60°C

Cable Characteristics

Jacket Color	Yellow
Jacket Material	Low Smoke Zero Halogen
Buffer Material	Hard Elastomeric
Cable Weight	5 kg/km (3 lbs/1000')
Cable Diameter	2.0 mm (0.08 in)

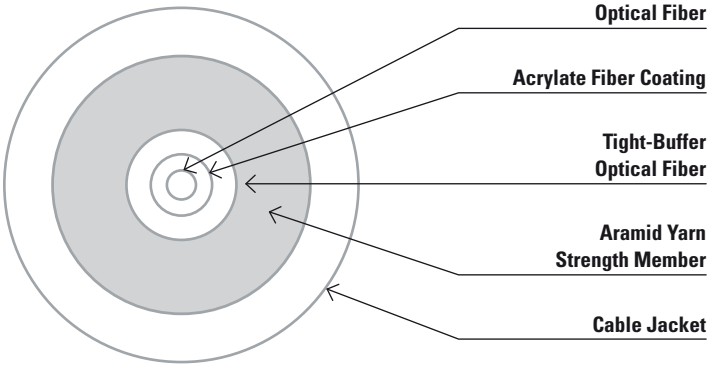
- Suitable for general purpose indoor use, such as routing connections in patching systems.
- Compatible with all standard fiber optic connectors designed for small form-factor simplex and duplex connectors such as MY-RJ and LC connectors.
- High performance tight-buffered coating on each optical fiber for environmental and mechanical protection.
- Zero-halogen cables (Z jacket) meet the requirements of IEC 60754-2.

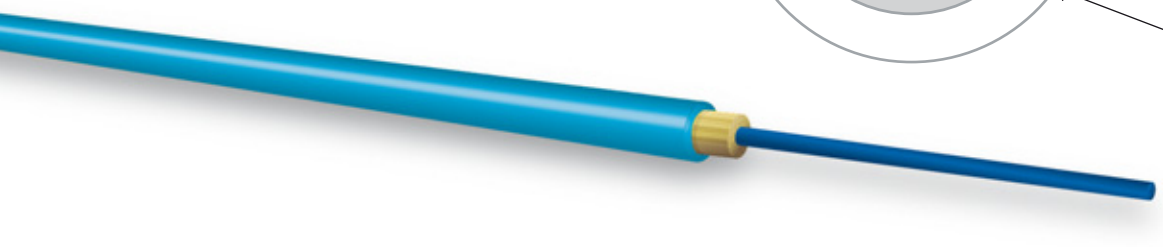
NOTE

OCC **1 CHANNEL**

A-Series Micro Assembly
LSZH Cables
(2.0mm & 1.6mm)

Part #: AE001ZABT9QZ





OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	ABT
Industry Standard Designation	Bend Tolerant Laser Optimized OM3 ISO/IEC 11801
Core/Cladding Diameter (µm)	50/125
Numeric Aperture	0.20
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	1000/600
10-Gigabit Ethernet Distance (m)	300/300
Maximum Cabled Attenuation (dB/km)	3.0/1.0
Minimum Laser EMB Bandwidth (MHz-km)	2000/500
Minimum OFL LED Bandwidth (MHz-km)	1500/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	200 Impacts
Crush Resistance TIA/EIA-455-41A	500 N/cm
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +70°C
Installation Temperature (actual temp. of cable)	0°C to +60°C

Cable Characteristics

Jacket Color	Aqua
Jacket Material	Low Smoke Zero Halogen
Buffer Material	Hard Elastomeric
Cable Weight	5 kg/km (3 lbs/1000')
Cable Diameter	2.0 mm (0.08 in)

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	300 N (67 lbs)	160 N (36 lbs)
Min Bend Radius	3.8 cm (1.5 in)	2.5 cm (1.0 in)

- Suitable for general purpose indoor use, such as routing connections in patching systems.
- Compatible with all standard fiber optic connectors designed for small form-factor simplex and duplex connectors such as MY-RJ and LC connectors.
- High performance tight-buffered coating on each optical fiber for environmental and mechanical protection.
- Zero-halogen cables (Z jacket) meet the requirements of IEC 60754-2.

NOTE

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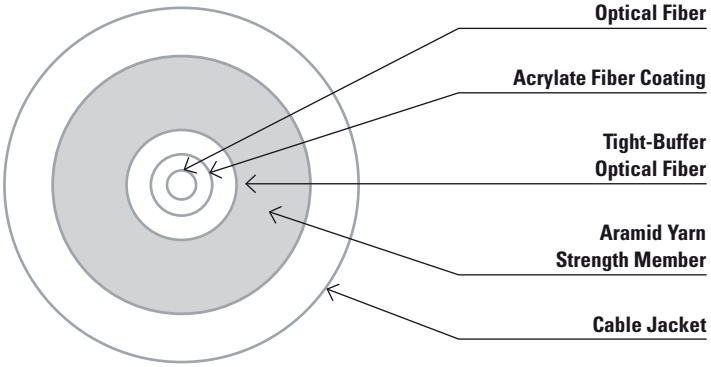
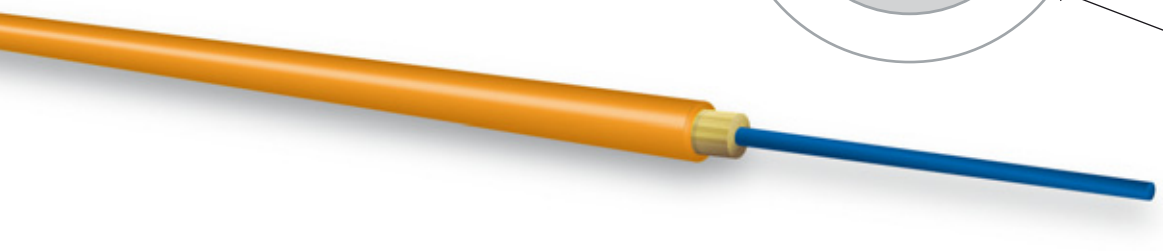
OCC **1 CHANNEL**

A-Series Micro Assembly
LSZH Cables
(2.0mm & 1.6mm)

Part #: AE001ZWLX90Z





Laser Ultra-Fox™ Fiber Performance

Fiber Code	WLX
Industry Standard Designation	OM1+ ISO/IEC 11801
Core/Cladding Diameter (µm)	62.5/125
Numeric Aperture	0.275
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	500/1000
10-Gigabit Ethernet Distance (m)	33/300
Maximum Cabled Attenuation (dB/km)	3.0/1.0
Minimum Laser EMB Bandwidth (MHz-km)	385/500
Minimum OFL LED Bandwidth (MHz-km)	200/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	300 N (67 lbs)	160 N (36 lbs)
Min Bend Radius	3.8 cm (1.5 in)	2.5 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	200 Impacts
Crush Resistance TIA/EIA-455-41A	500 N/cm
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +70°C
Installation Temperature (actual temp. of cable)	0°C to +60°C

Cable Characteristics

Jacket Color	Orange
Jacket Material	Low Smoke Zero Halogen
Buffer Material	Hard Elastomeric
Cable Weight	5 kg/km (3 lbs/1000')
Cable Diameter	2.0 mm (0.08 in)

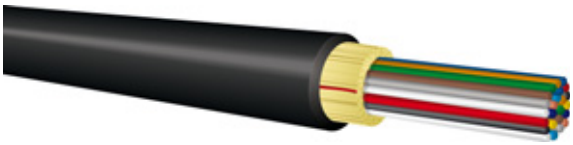
- Suitable for general purpose indoor use, such as routing connections in patching systems.
- Compatible with all standard fiber optic connectors designed for small form-factor simplex and duplex connectors such as MY-RJ and LC connectors.
- High performance tight-buffered coating on each optical fiber for environmental and mechanical protection.
- Zero-halogen cables (Z jacket) meet the requirements of IEC 60754-2.

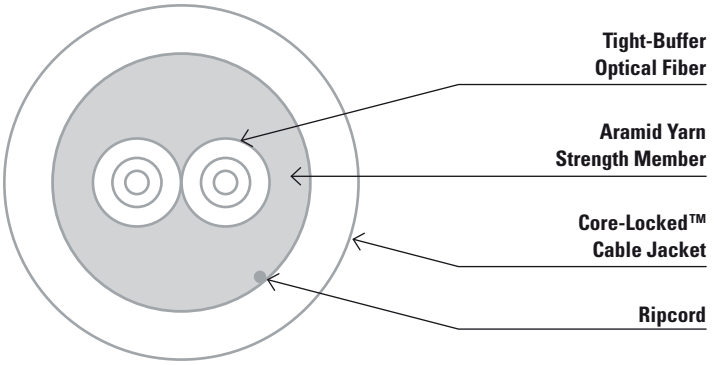
NOTE

OCC **2 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX002GSLA9KB





OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	SLA
Industry Standard Designation	Low Water Peak Single Mode ITU-T G.657.A1 and ITU-T G.652.D
Core/Cladding Diameter (µm)	9/125
Wavelength (nm)	1310/1550
Maximum Cabled Attenuation (dB/km)	0.5/0.5
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Zero Dispersion Slope (ps/nm2-km)	0.092
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.0 cm (2.0 in)	2.5 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	21 kg/km (14 lbs/1000')
Cable Diameter	5.0 mm (0.20 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

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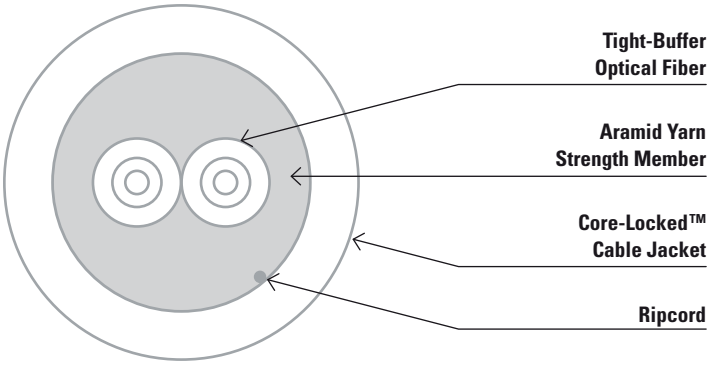
OCC **2 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX002GABT9KB



OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	ABT
Industry Standard Designation	Bend Tolerant Laser Optimized OM3 ISO/IEC 11801
Core/Cladding Diameter (µm)	50/125
Numeric Aperture	0.20
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	1000/600
10-Gigabit Ethernet Distance (m)	300/300
Maximum Cabled Attenuation (dB/km)	3.0/1.0
Minimum Laser EMB Bandwidth (MHz-km)	2000/500
Minimum OFL LED Bandwidth (MHz-km)	1500/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.0 cm (2.0 in)	2.5 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	21 kg/km (14 lbs/1000')
Cable Diameter	5.0 mm (0.20 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

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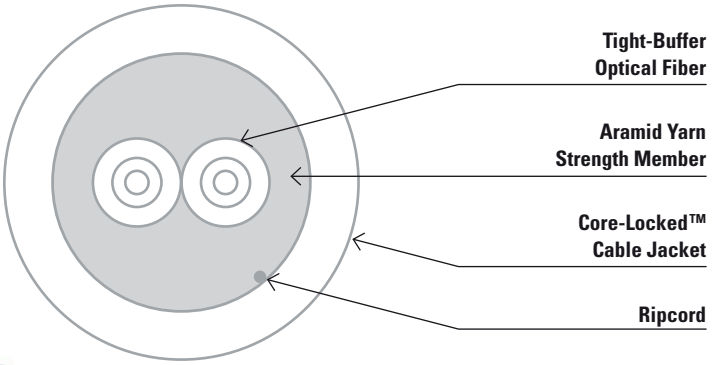
OCC **2 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX002GWLX9KB



OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	WLX
Industry Standard Designation	OM1+ ISO/IEC 11801
Core/Cladding Diameter (µm)	62.5/125
Numeric Aperture	0.275
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	500/1000
10-Gigabit Ethernet Distance (m)	33/300
Maximum Cabled Attenuation (dB/km)	3.5/1.5
Minimum Laser EMB Bandwidth (MHz-km)	385/500
Minimum OFL LED Bandwidth (MHz-km)	200/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.0 cm (2.0 in)	2.5 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	21 kg/km (14 lbs/1000')
Cable Diameter	5.0 mm (0.20 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

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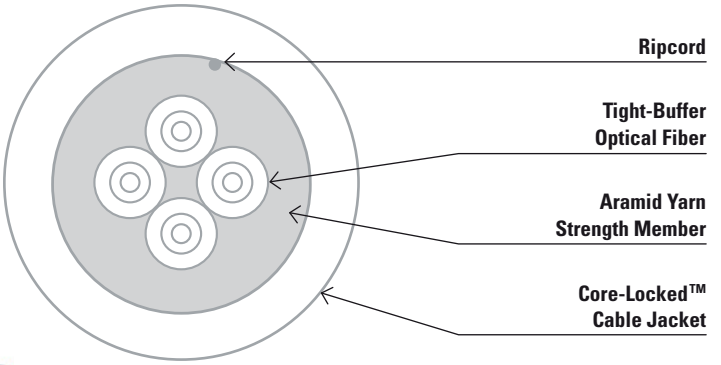
OCC **4 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX004GSLA9KB



OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	SLA
Industry Standard Designation	Low Water Peak Single Mode ITU-T G.657.A1 and ITU-T G.652.D
Core/Cladding Diameter (µm)	9/125
Wavelength (nm)	1310/1550
Maximum Cabled Attenuation (dB/km)	0.5/0.5
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Zero Dispersion Slope (ps/nm2-km)	0.092
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.5 cm (2.2 in)	2.8 cm (1.0 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	27 kg/km (18 lbs/1000')
Cable Diameter	5.5 mm (0.22 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

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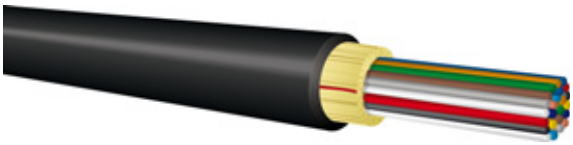
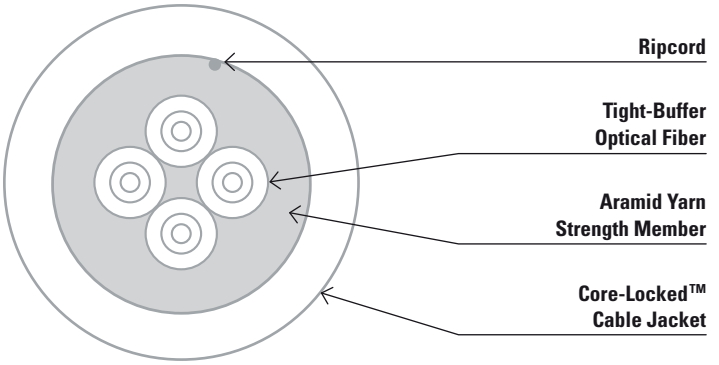
OCC **4 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX004GABT9KB





OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	ABT
Industry Standard Designation	Bend Tolerant Laser Optimized OM3, ISO/IEC 11801
Core/Cladding Diameter (µm)	50/125
Numeric Aperture	0.20
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	1000/600
10-Gigabit Ethernet Distance (m)	300/300
Maximum Cabled Attenuation (dB/km)	3.0/1.0
Minimum Laser EMB Bandwidth (MHz-km)	2000/500
Minimum OFL LED Bandwidth (MHz-km)	1500/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.5 cm (2.2 in)	2.8 cm (1.1 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	27 kg/km (18 lbs/1000')
Cable Diameter	5.5 mm (0.22 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

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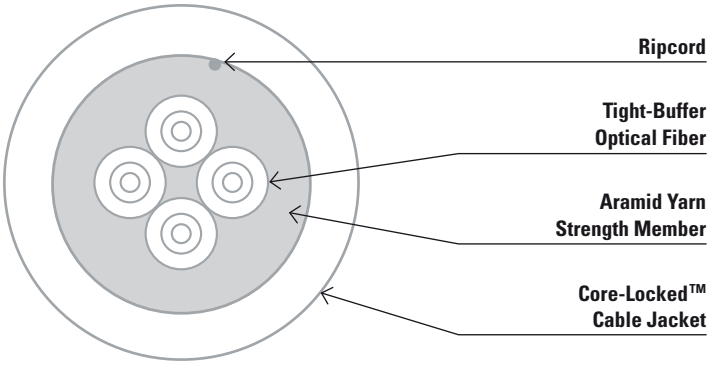
OCC **4 CHANNEL**

D-Series Distribution
Field Broadcast Cables

Part #: DX004GWLX9KB



OPTICAL CABLE CORPORATION

Laser Ultra-Fox™ Fiber Performance

Fiber Code	WLX
Industry Standard Designation	OM1+ ISO/IEC 11801
Core/Cladding Diameter (µm)	62.5/125
Numeric Aperture	0.275
Wavelength (nm)	850/1310
Gigabit Ethernet Distance (m)	500/1000
10-Gigabit Ethernet Distance (m)	33/300
Maximum Cabled Attenuation (dB/km)	3.5/1.5
Minimum Laser EMB Bandwidth (MHz-km)	385/500
Minimum OFL LED Bandwidth (MHz-km)	200/500
Primary Coating Diameter (µm)	245
Secondary Buffer Diameter (µm)	900
Proof Test Level (kpsi)	100

Installation and Operating Characteristics

	Installation	Operating
Max Tensile Load	1,800 N (400 lbs)	600 N (130 lbs)
Min Bend Radius	5.5 cm (2.5 in)	2.8 cm (1.1 in)

Mechanical and Environmental

Impact Resistance EIA/TIA-455-25A	1,500 Impacts
Crush Resistance TIA/EIA-455-41A	1,800 N/cm
Operating Temperature	-40°C to +85°C
Storage Temperature	-70°C to +85°C

Cable Characteristics

Jacket Color	Black
Jacket Material	Low Smoke Zero Halogen Polyurethane
Buffer Material	Hard Elastomeric
Cable Weight	27 kg/km (18 lbs/1000')
Cable Diameter	5.5 mm (0.22 in)

- Deployable cable that is ideal for use in harsh environments where deployment and retrieval for reuse are required.
- Extremely strong, lightweight, rugged, survivable tight-buffered cables are designed for broadcast field use and commercial applications.
- Compact, round cable design for ease of transportation and deployment.
- Core-locked jacket for improved mechanical performance.
- Designed for use in adverse environments where reduced size and weight are important.
- Helically stranded cable core for flexibility, survival in difficult pulls, and exceptional mechanical protection for the optical fibers.
- Cables have been tested and are in use in broadcast data communications applications worldwide.
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments.
- Suitable for industrial, mining and petrochemical environments; chemical resistant.
- Crush resistant and resilient with a thick layer of aramid strength members.
- Polyurethane jacketed for abrasion, cut and chemical resistance.
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400lbs.).
- Tactical Polyurethane (C) outer jacket materials is standard; Flame-Retardant Tactical (V) and Low-Smoke Zero-Halogen (G) outer jacket materials are available.

NOTE

This specification is valid as of 02/22/13 12:29, however, the specification is subject to change at any time.

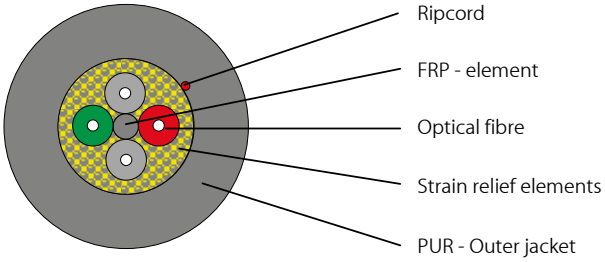
LEONI **2 FIBERS**

LEONI

LEONI Part No.: **84951035#**

Fiber**Connect**® **A-V(ZN)11Y 2 ... TB900L**

Profile view:



Design:

Cable core:

- Tight buffered fibres (9/125), (50/125) or (62.5/125)
  bend insensitive, with diameter 0.9 mm
  colours: red, grey (filler), green and grey (filler) stranded around a central strength member
- Strain relief elements (aramid) with additional compression relief elements

Outer jacket:

- Polyurethane (TPE-U) with approx. 1.2 mm wall,
  colour: black, or according customer requirement
  Outer diameter approx. 5.5 mm
- Ripcord under the jacket
- Inkjet-marking (white):
  LEONI - FiberConnect® A-V(ZN)11Y 2 (fibre type) TB900L (alternating current symbol twice), (order no.), (reel no.), (sequential length in metres)

Application/Installation:

- Flexible cable for moved application indoor and outdoor
- Indoor cable for the installation in cable ducts and in tubes and also suitable for interconnections in harsh industrial environments
- Good installation through ripcords to open the jackets
- For direct connector assembly
- Ruggedized for industrial application, chemical resistance, abrasion resistance and crush resistance
- Not suitable for underground laying (direct buried)

Transmission properties:

- Transmission characteristics see separate fibre data-sheet

LEONI **2 FIBERS**

LEONI

LEONI Part No.: **84951035#**

Mechanical properties:

▪ Min. bending radius acc. to IEC 60794-1-2, method E11, procedure 1	
static	10 x outside diameter
dynamic	15 x outside diameter
▪ Max. tensile strength acc. to IEC 60794-1-2, method E1	
short-term	max. 2500 N
long-term	max. 1500 N
▪ Max. crush resistance acc. to IEC 60794-1-2, method E3	
short-term	max. 8000 N/dm
long-term	max. 4000 N/dm
▪ Impact resistance acc. to IEC 60794-1-2, method E4	3 Impacts, 1.5 Nm
▪ Flexing test acc. IEC 60794-1-2 E8	(2000 cycles, D = 80 mm, F = 10 N, L (pulling path) = 1.5 m)
▪ Weight	approx. 28.0 kg/km
▪ Drag chain test	1 000 000 cycles

Thermal properties:

▪ Transport and storage	- 55 °C to + 85 °C
▪ Installation	- 20 °C to + 60 °C
▪ Operation	- 55 °C to + 85 °C

Fire performance:

▪ Cable is flame-retardant	acc. to IEC 60332-1-2
▪ Halogen-free	acc. to IEC 60754-1
▪ Acidity of the combustion gases	acc. to IEC 60754-2

Chemical properties:

- Resistance to oil, petrol, acid and leach
- UV - resistant

Standardisation:

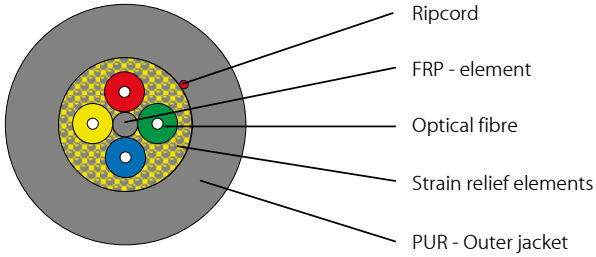
- IEC 60 794-2

LEONI **4 FIBERS**

LEONI Part No.: **84951036#**

Fiber**Connect®** **A-V(ZN)11Y 4 ... TB900L**

Profile view:



Design:

Cable core:

- Tight buffered fibres (9/125), (50/125) or (62.5/125)
  bend insensitive, with diameter 0.9 mm
  colours: red, green, blue and yellow stranded around a central strength member
- Strain relief elements (aramid) with additional compression relief elements

Outer jacket:

- Polyurethane (TPE-U) with approx. 1.2 mm wall,
  colour: black, or according customer requirement
  Outer diameter approx. 5.5 mm
- Ripcord under the jacket
- Inkjet-marking (white):
  LEONI - FiberConnect® A-V(ZN)11Y 4 (fibre type) TB900L (alternating current symbol twice), (order no.), (reel no.), (sequential length in metres)

Application/Installation:

- Flexible cable for moved application indoor and outdoor
- Indoor cable for the installation in cable ducts and in tubes and also suitable for interconnections in harsh industrial environments
- Good installation through ripcords to open the jackets
- For direct connector assembly
- Ruggedized for industrial application, chemical resistance, abrasion resistance and crush resistance
- Not suitable for underground laying (direct buried)

Transmission properties:

- Transmission characteristics see separate fibre data-sheet

LEONI **4 FIBERS**

LEONI

LEONI Part No.: **84951036#**

Mechanical properties:

▪ Min. bending radius acc. to IEC 60794-1-2, method E11, procedure 1	
static	10 x outside diameter
dynamic	15 x outside diameter
▪ Max. tensile strength acc. to IEC 60794-1-2, method E1	
short-term	max. 2500 N
long-term	max. 1500 N
▪ Max. crush resistance acc. to IEC 60794-1-2, method E3	
short-term	max. 8000 N/dm
long-term	max. 4000 N/dm
▪ Impact resistance acc. to IEC 60794-1-2, method E4	3 Impacts, 1.5 Nm
▪ Flexing test acc. IEC 60794-1-2 E8	(2000 cycles, D = 80 mm, F = 10 N, L (pulling path) = 1.5 m)
▪ Weight	approx. 28.0 kg/km
▪ Drag chain test	1 000 000 cycles

Thermal properties:

▪ Transport and storage	- 55 °C to + 85 °C
▪ Installation	- 20 °C to + 60 °C
▪ Operation	- 55 °C to + 85 °C

Fire performance:

▪ Cable is flame-retardant	acc. to IEC 60332-1-2
▪ Halogen-free	acc. to IEC 60754-1
▪ Acidity of the combustion gases	acc. to IEC 60754-2

Chemical properties:

- Resistance to oil, petrol, acid and leach
- UV - resistant

Standardisation:

- IEC 60 794-2

NOTE

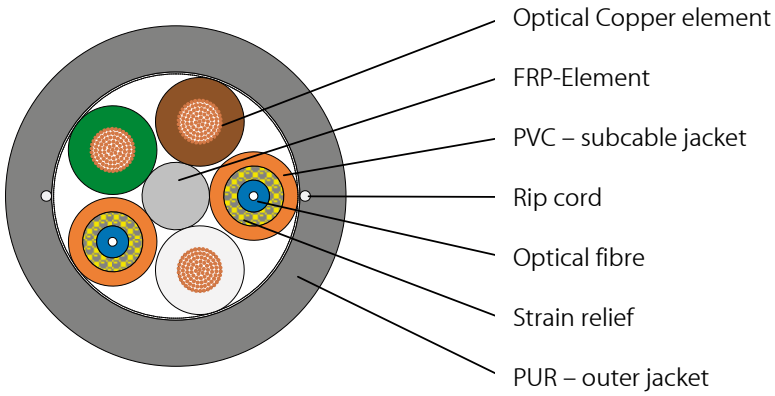
This specification is valid as of 08/26/13, however, the specification is subject to change at any time.

LEONI **HYBRID 2-2**

LEONI Part No.: **V1267**

Fiber**Connect**® **AT-VQ(ZN)Y11Y 2… + 3x1 mm²**

Profile view:



Design:

Subcable:

- Tight buffered fibre (TB900L), outer diameter 0.9 mm
  colour: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief elements (aramid), damp-proof
- Subcable-jacket Polyvinylchloride (PVC) with approx. 0.5 mm wall,
  with approx. 0.4 mm wall, colour: orange
- Diameter 2.5 mm with numeric coding

Copper element:

- Flexible core LiY 1.0 mm², outer diameter 2.5 mm,
  colour: brown, green, white

Stranding:

- FRP-element (Fibre Reinforced Plastic) in centre, two break-out-subcables and three copper elements stranded in one layer

Cable jacket:

- Polyurethane (PUR) with approx. 1.3 mm wall, colour: black
- Outer diameter 9.6 mm
- Two diametrically opposed ripcords under the jacket
- Inkjet-marking white:
  LEONI - FiberConnect® AT-VQ(ZN)Y11Y 2 *fibre type + 3x1.0 qmm, buffer type* (alternating current symbol twice), (Order No.), (Reel No.), (sequential length in metres)

Application/Installation:

- For indoor and outdoor applications as well as for using in harsh industrial environments
- The subcables are longitudinally water protected
- For direct connector assembly

LEONI **HYBRID 2-2**

LEONI

LEONI Part No.: **V1267**

Transmission characteristics:

- Transmission characteristics see separate fibre data-sheet

Mechanical characteristics:

- Min. bending radius
  static 10 x outside diameter
  dynamic 15 x outside diameter
- Max. crush resistance long term 1500 N/dm
- Max. pull force long term 1200 N

Thermal characteristics:

- Transport and storage - 25 °C to + 80 °C
- Installation - 5 °C to + 50 °C
- In use - 20 °C to + 80 °C

Chemical characteristics:

- Good resistance to oil, petrol, acid and leach
- UV-resistance of outer-jacket in according to DIN EN ISO 4892-2, Procedure A, UV-application 500 hours

Standardisation:

- None

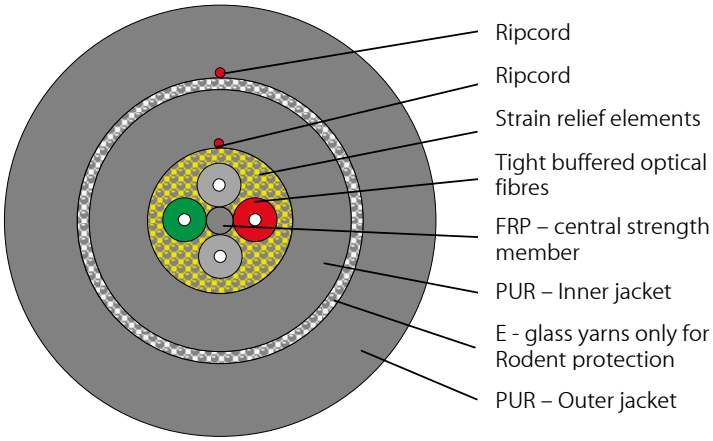
LEONI **RODENT PROOF 2 FIBERS**

LEONI

LEONI Part No.: **84951135#**

Fiber**Connect® A-V(ZN)11Y(ZN)B11Y 2 ... TB900L**

Profile view / Querschnittszeichnung:



Design / Aufbau:

Cable core / Kabelseele:

Tight buffered fibre (E9/125), (G50/125) or (G62.5/125) bend insensitive, outer diameter 0.9 mm
Festader (E9/125), (G50/125) oder (G62,5/125) biegeunempfindlich, Außendurchmesser 0,9 mm
Core colours: red, grey (filler), green and grey (filler)
Farbcode Adern: rot, grau (Blindelement), grün und grau (Blindelement)

Stranding / Verseilung:

Tight buffered fibres stranded around a central strength member (FRP).
Festadern um zentrales Stützelement aus glasfaserverstärktem Kunststoff (GFK) verseilt.
Strain relief elements (aramid) with additional compression relief elements
Zugentlastungselemente (Aramid) mit zusätzlichen Druckentlastungselementen

Inner jacket / Innenmantel:

Polyurethane (TPE-U), wall thickness approx. 1.2 mm
Outer diameter approx. 5.5 mm
Colour: black, or according customer requirement
Polyurethan (TPE-U), Nennwandstärke ca. 1,2 mm
Außendurchmesser ca. 5,5 mm
Farbe: Schwarz, oder nach Kundenwunsch
One ripcord under the jacket
Ein Reißfaden unter dem Mantel

LEONI **RODENT PROOF 2 FIBERS**

LEONI Part No.: **84951135#**

Armour / Bewehrung:

Multifunctional E-glass yarns, swellable, wrapped in two layers (left and right spin), not as strain relief elements, only as non-metallic rodent protection
Multifunktionale Glasrovingumspinnung, feuchtigkeitssperrend, zweilagig (links und rechts Drall), nicht als Zugentlastungselemente, nur als nichtmetallischer Nagetierschutz

Outer jacket / Außenmantel:

Polyurethan (TPE-U), wall thickness approx. 1.5 mm
Outer diameter approx. 9.4 mm
Colour: black, or according customer requirement
Polyurethan (TPE-U), Nennwandstärke ca. 1,5 mm
Außendurchmesser ca. 9,4 mm
Farbe: schwarz, oder nach Kundenanforderung
One ripcord under the jacket
Ein Reißfaden unter dem Mantel
Inkjet-marking (white):
Inkjet - Aufdruck (weiß):
LEONI - FiberConnect® A-V(ZN)11Y(ZN)B11Y 2 fibre type TB900L (alternating current symbol twice), (Order No.), (Reel No.), (sequential length in metres)
LEONI - FiberConnect® A-V(ZN)11Y(ZN)B11Y 2 Fasertyp TB900L (zweimal Wechselstromsymbol), (Auftragsnummer), (Trommelnummer), (Metermarkierung)

Application/Installation / Anwendung/Verlegung:

Flexible cable for moved application indoor and outdoor
Flexibles Kabel für den bewegten Einsatz im Innen- und Außenbereich
Indoor cable for the installation in cable ducts and in tubes and also suitable for interconnections in harsh industrial environments
Innenkabel für ortsfeste Verlegung in Kabelkanälen und Rohren, sowie für Rangierzwecke in rauer Industrieumgebung
Fiber optic cable with additional rodent proof
LWL-Kabel mit zusätzlichem Nagetierschutz
Good installation through ripcords to open the jackets
Montagefreundlich durch Reißfäden zum Öffnen der Mäntel
For direct connector assembly
Für direkte Steckerkonfektion
Ruggedized for industrial application, chemical resistance, abrasion resistance and crush resistance
Widerstandsfähig, für raue Industrieanwendung, hinsichtlich Chemikalienbeständigkeit, Abriebfestigkeit und Querdruckfestigkeit
Not suitable for underground laying (direct buried)
Direkte Erdverlegung nicht zulässig

Transmission characteristics / Übertragungseigenschaften:

Transmission characteristics see separate fibre data-sheet
Übertragungseigenschaften siehe gesondertes Faserdatenblatt

Mechanical characteristics / Mechanische Eigenschaften:

Min. bending radius fixed (static) with bend able robust fibre acc. IEC 60794-1-2 E11A Min. Biegeradius fest verlegt (statisch) mit biegeresistenter Faser nach IEC 60794-1-2 E11A	10 x outer diameter

LEONI **RODENT PROOF 2 FIBERS**

LEONI Part No.: **84951135#**

Min. bending radius during assembly (dynamic), with additional tensile strain acc. IEC 60794-1-2 E6 Min. Biegeradius bei Montage (dynamisch), mit zusätzlicher Zugbelastung nach IEC 60794-1-2 E6	15 x outer diameter
Max. tensile force acc. IEC 60794-1-2 E1, long term Max. Zugkraft nach IEC 60794-1-2 E1, langzeitig	2000 N
Max. tensile force acc. IEC 60794-1-2 E1, short term Max. Zugkraft nach IEC 60794-1-2 E1, kurzzeitig	2500 N
Max. crush resistance acc. IEC 60794-1-2 E3, long term Max. Querdruckfestigkeit nach IEC 60794-1-2 E3, langzeitig	4000 N/dm
Max. crush resistance acc. IEC 60794-1-2 E3, short term Max. Querdruckfestigkeit nach IEC 60794-1-2 E3, kurzzeitig	8000 N/dm
Impact resistance acc. IEC 60794-1-2 E4 Schlagfestigkeit nach IEC 60794-1-2 E4	50 impacts, 2.0 Nm, R = 12.5 mm
Flexing test acc. IEC 60794-1-2 E8 Wechselbiegeprüfung nach IEC 60794-1-2 E8	(2000 cycles, D = 80 mm, F = 10 N, L (pulling path) = 1.5 m)
Cable weight Kabelgewicht	approx. 105 kg/km
Drag chain test Schleppkettentest	1 000 000 cycles

Thermal characteristics / Thermische Eigenschaften:

Transport and storage Transport und Lagerung	- 55°C to + 85°C
Installation Verlegung	- 20°C to + 60°C
In use acc. IEC 60794-1-2 F1 Im Betrieb nach IEC 60794-1-2 F1	- 55°C to + 85°C

Fire performance / Brandverhalten:

Cable is flame-retardant Flammwidrigkeit	acc. to IEC 60332-1-2
Halogen-free Halogenfreiheit	acc. to IEC 60754-1
Acidity of the combustion gases Azidität der Brandgase	acc. to IEC 60754-2

Chemical characteristics / Chemische Eigenschaften:

Very good resistance to oil, petrol, acid and leach
Sehr gute Beständigkeit gegen Öl, Fett, Säuren und Laugen
UV-resistance of outer-jacket
UV-Beständigkeit des Außenmantels

Standardisation / Normung:

IEC 60794-2

NOTE

This specification is valid as of 08/26/13, however, the specification is subject to change at any time.

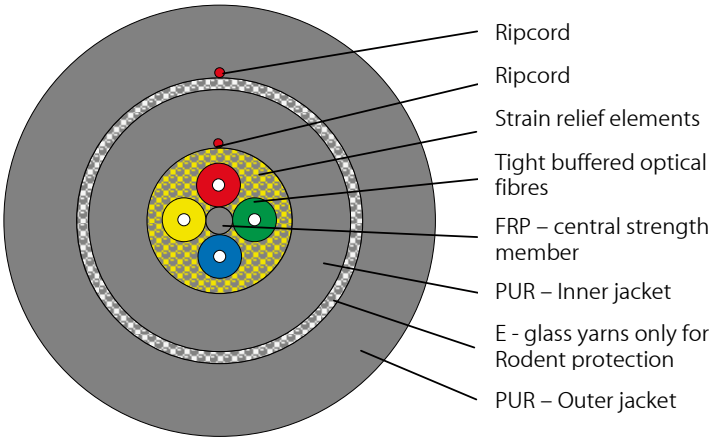
LEONI **RODENT PROOF 4 FIBERS**

LEONI

LEONI Part No.: **84951136#**

Fiber**Connect® A-V(ZN)11Y(ZN)B11Y 4 ... TB900L**

Profile view / Querschnittszeichnung:



Design / Aufbau:

Cable core / Kabelseele:

Tight buffered fibre (E9/125), (G50/125) or (G62.5/125) bend insensitive, outer diameter 0.9 mm
Festader (E9/125), (G50/125) oder (G62,5/125) biegeunempfindlich, Außendurchmesser 0,9 mm
Core colours: red, green, blue and yellow
Farbcode Adern: rot, grün, blau und gelb

Stranding / Verseilung:

Tight buffered fibres stranded around a central strength member (FRP).
Festadern um zentrales Stützelement aus glasfaserverstärktem Kunststoff (GFK) verseilt.
Strain relief elements (aramid) with additional compression relief elements
Zugentlastungselemente (Aramid) mit zusätzlichen Druckentlastungselementen

Inner jacket / Innenmantel:

Polyurethane (TPE-U), wall thickness approx. 1.2 mm
Outer diameter approx. 5.5 mm
Colour: black, or according customer requirement
Polyurethan (TPE-U), Nennwandstärke ca. 1,2 mm
Außendurchmesser ca. 5,5 mm
Farbe: Schwarz, oder nach Kundenwunsch
One ripcord under the jacket
Ein Reißfaden unter dem Mantel

LEONI **RODENT PROOF 4 FIBERS**

LEONI Part No.: **84951136#**

Armour / Bewehrung:

Multifunctional E-glass yarns, swellable, wrapped in two layers (left and right spin), not as strain relief elements, only as non-metallic rodent protection
Multifunktionale Glasrovingumspinnung, feuchtigkeitssperrend, zweilagig (links und rechts Drall), nicht als Zugentlastungselemente, nur als nichtmetallischer Nagetierschutz

Outer jacket / Außenmantel:

Polyurethan (TPE-U), wall thickness approx. 1.5 mm
Outer diameter approx. 9.4 mm
Colour: black, or according customer requirement
Polyurethan (TPE-U), Nennwandstärke ca. 1,5 mm
Außendurchmesser ca. 9,4 mm
Farbe: schwarz, oder nach Kundenanforderung
One ripcord under the jacket
Ein Reißfaden unter dem Mantel
Inkjet-marking (white):
Inkjet - Aufdruck (weiß):
LEONI - FiberConnect® A-V(ZN)11Y(ZN)B11Y 4 fibre type TB900L (alternating current symbol twice), (Order No.), (Reel No.), (sequential length in metres)
LEONI - FiberConnect® A-V(ZN)11Y(ZN)B11Y 4 Fasertyp TB900L (zweimal Wechselstromsymbol), (Auftragsnummer), (Trommelnummer), (Metermarkierung)

Application/Installation / Anwendung/Verlegung:

Flexible cable for moved application indoor and outdoor
Flexibles Kabel für den bewegten Einsatz im Innen- und Außenbereich
Indoor cable for the installation in cable ducts and in tubes and also suitable for interconnections in harsh industrial environments
Innenkabel für ortsfeste Verlegung in Kabelkanälen und Rohren, sowie für Rangierzwecke in rauer Industrieumgebung
Fiber optic cable with additional rodent proof
LWL-Kabel mit zusätzlichem Nagetierschutz
Good installation through ripcords to open the jackets
Montagefreundlich durch Reißfäden zum Öffnen der Mäntel
For direct connector assembly
Für direkte Steckerkonfektion
Ruggedized for industrial application, chemical resistance, abrasion resistance and crush resistance
Widerstandsfähig, für raue Industrieanwendung, hinsichtlich Chemikalienbeständigkeit, Abriebfestigkeit und Querdruckfestigkeit
Not suitable for underground laying (direct buried)
Direkte Erdverlegung nicht zulässig

Transmission characteristics / Übertragungseigenschaften:

Transmission characteristics see separate fibre data-sheet
Übertragungseigenschaften siehe gesondertes Faserdatenblatt

Mechanical characteristics / Mechanische Eigenschaften:

Min. bending radius fixed (static) with bend able robust fibre acc. IEC 60794-1-2 E11A Min. Biegeradius fest verlegt (statisch) mit biegeresistenter Faser nach IEC 60794-1-2 E11A	10 x outer diameter

LEONI **RODENT PROOF 4 FIBERS**

LEONI Part No.: **84951136#**

Min. bending radius during assembly (dynamic), with additional tensile strain acc. IEC 60794-1-2 E6 Min. Biegeradius bei Montage (dynamisch), mit zusätzlicher Zugbelastung nach IEC 60794-1-2 E6	15 x outer diameter
Max. tensile force acc. IEC 60794-1-2 E1, long term Max. Zugkraft nach IEC 60794-1-2 E1, langzeitig	2000 N
Max. tensile force acc. IEC 60794-1-2 E1, short term Max. Zugkraft nach IEC 60794-1-2 E1, kurzzeitig	2500 N
Max. crush resistance acc. IEC 60794-1-2 E3, long term Max. Querdruckfestigkeit nach IEC 60794-1-2 E3, langzeitig	4000 N/dm
Max. crush resistance acc. IEC 60794-1-2 E3, short term Max. Querdruckfestigkeit nach IEC 60794-1-2 E3, kurzzeitig	8000 N/dm
Impact resistance acc. IEC 60794-1-2 E4 Schlagfestigkeit nach IEC 60794-1-2 E4	50 impacts, 2.0 Nm, R = 12.5 mm
Flexing test acc. IEC 60794-1-2 E8 Wechselbiegeprüfung nach IEC 60794-1-2 E8	(2000 cycles, D = 80 mm, F = 10 N, L (pulling path) = 1.5 m)
Cable weight Kabelgewicht	approx. 105 kg/km
Drag chain test Schleppkettentest	1 000 000 cycles

Thermal characteristics / Thermische Eigenschaften:

Transport and storage Transport und Lagerung	- 55°C to + 85°C
Installation Verlegung	- 20°C to + 60°C
In use acc. IEC 60794-1-2 F1 Im Betrieb nach IEC 60794-1-2 F1	- 55°C to + 85°C

Fire performance / Brandverhalten:

Cable is flame-retardant Flammwidrigkeit	acc. to IEC 60332-1-2
Halogen-free Halogenfreiheit	acc. to IEC 60754-1
Acidity of the combustion gases Azidität der Brandgase	acc. to IEC 60754-2

Chemical characteristics / Chemische Eigenschaften:

Very good resistance to oil, petrol, acid and leach
Sehr gute Beständigkeit gegen Öl, Fett, Säuren und Laugen
UV-resistance of outer-jacket
UV-Beständigkeit des Außenmantels

Standardisation / Normung:

IEC 60794-2

BRUGG **RODENT PROOF**

BRUGG CABLES Well connected.

Fibre Optic Metallic Cables / Ropes

BRUsteel

3_7_4

LLK-BST, patented

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

Construction
- PA outer sheath
- Steel wires
- Gel-filled steel loose tube
- 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

Standards
IEC 60794
Standards, see also data sheet 3_0_9

Remarks
Cable is available with different fibre types 2_1_2x_x and 2_1_3x_x
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 loose tube colour acc. to data sheet 3_0_3
- Instructions for installation and use see data sheet 3_6_0

Technical data

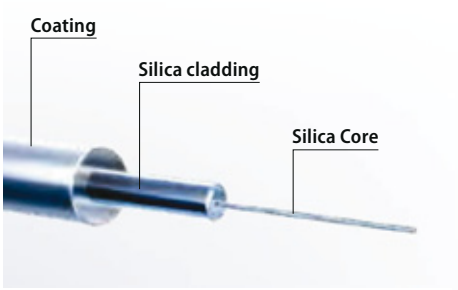
Type	Max. no. of fibres units	Cable ø mm	Weight kg/km	Max. tensile strength short term N	Max. tensile strength long term N
1F	1	3.4	18	1000	750
2F	2	3.8	25	1500	1100
→ 4F	4	3.8	25	1300	900
8F	8	4.8	46	3500	2600

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

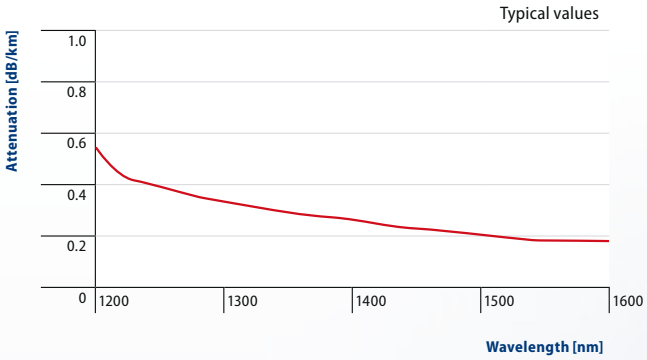
NOTE

LEONI **SINGLEMODE G657.A1**

Reliable tried and tested singlemode fiber for LAN, FTTX and long distance applications



Typical spectral attenuation for LWP SMF+



Description

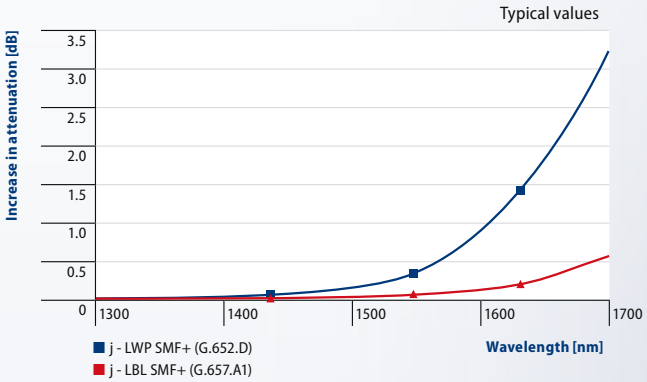
For the bridging of larger distances in LAN cabling as well as for FTTX applications we offer reliable high-performance singlemode fibers.

The G.657.A1 compliant fibers are compatible with installed networks and offer optimized bending properties. With lowest attenuation, perfect fiber geometry and tight fiber diameter tolerances, they are perfectly suited for the system demands in LAN networks.

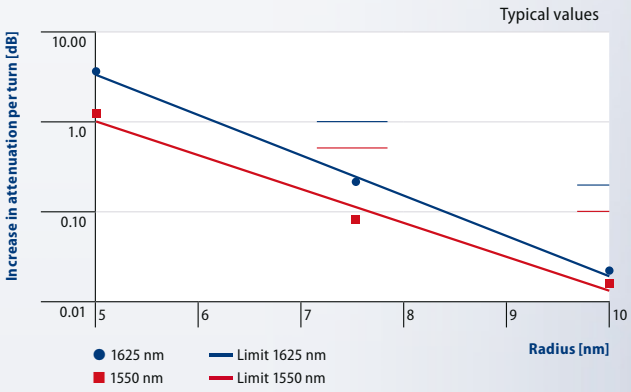
In FTTX applications they meet the requirements for robust and cost-efficient fiber solutions with a future-proof perspective.

In long-distance applications our G.652.D singlemode fibers guarantee cost advantages and performance consistency as required for the transmission of high data rates over long distances.

Comparison of bend-performance of the LBL singlemode fiber to other G.652.D SMF (10 mm radius, 1 turn)



Typical bend-performance of ULBL SMF (G.657.B2)



NOTE

This specification is valid as of 08/26/13, however, the specification is subject to change at any time.

LEONI **SINGLEMODE G657.A1**

LEONI

		LWP SMF+ (ITU-T G.652.D)	LBL SMF (ITU-T G.657 A.1)	ULBL SMF (ITU-T G.657.B2)
Optical properties		Specific values		
Attenuation coefficient [1] [dB/km]	1310 nm	≤ 0.33 to ≤ 0.35	≤ 0.33 to ≤ 0.36	≤ 0.38
	1383 nm [2]	≤ 0.31 to ≤ 0.35	≤ 0.31 to ≤ 0.36	–
	1550 nm	≤ 0.19 to ≤ 0.21	≤ 0.19 to ≤ 0.21	≤ 0.25
	1625 nm	≤ 0.20 to ≤ 0.23	≤ 0.20 to ≤ 0.23	≤ 0.25
Attenuation variance range [3] [dB/km]	1285–1330 nm	≤ 0.03	≤ 0.03	–
	1530–1570 nm	≤ 0.02	≤ 0.02	
	1460–1625 nm	≤ 0.04	≤ 0.04	
Mode field Ø [µm]	1310 nm	9,2 ± 0.4	8,6 ± 0.4	7.5 ± 0.4
	1550 nm	10.4 ± 0.5	9.8 ± 0.5	
Discontinuity (tp = 1 µs) [dB]	1310 nm	≤ 0.05	≤ 0.05	–
	1550 nm	≤ 0.05	≤ 0.05	–
Attenuation uniformity [dB]		≤ 0.05	≤ 0.05	–
Macrobending loss				
Bend-induced attenuation [dB]				
100 turns Radius 50 mm	1310 nm 1550 nm	≤ 0.05 ≤ 0.05	– –	– –
1 turn Radius 32 mm	1550 nm	≤ 0.05	– –	– –
10 turns Radius 15 mm	1550 nm 1625 nm	– –	≤ 0.03 ≤ 0.2	≤ 0.03 ≤ 0.1
1 turn Radius 10 mm	1550 nm 1625 nm	– –	≤ 0.3 ≤ 1.0	≤ 0.1 ≤ 0.2
1 turn Radius 7.5 mm	1550 nm 1625 nm	– –	– –	≤ 0.5 ≤ 1.0
Fiber cut-off wavelength λ_c [nm]		1200–1330	≤ 1340	–
Cable cut-off wavelength λ_{cc} [nm]		≤ 1260	≤ 1260	–
Zero crossing of dispersion λ_0 [nm]		1300 ≤ λ_0 ≤ 1324	1300 ≤ λ_0 ≤ 1324	–
Slope at zero crossing of dispersion S_0 [ps/nm²×km]		≤ 0.092	≤ 0.092	–
Chromatic dispersion [ps/nm×km]	1270–1340 nm	≤ 5.00	≤ 5.00	–
	1285–1330 nm	≤ 3.00	≤ 3.00	–
	1550 nm	≤ 18.00	≤ 18.00	–
Effective group index	1310 nm	1.467	1.467	–
	1383 nm	1.467	1.467	–
	1550 nm	1.467	1.467	–
Value of polarization mode dispersion link [4] [ps/√km]		≤ 0.06	≤ 0.06	–
Individual fiber [5] [ps/√km]		≤ 0.10	≤ 0.10	–

Mechanical properties		Specified values
Proof test	[kpsi]	≥ 100
	[N]	≥ 8.8
	[GPa]	≥ 0.7
Dynamic tensile strength in an unaged fiber (0.5 m) [GPa]	Median tensile strength	≥ 3.8
	Tensile strength 15 %	≥ 3.3
Dynamic tensile strength in an aged fiber (0.5 m) [GPa]	Median tensile strength	≥ 3.03
	Tensile strength 15 %	≥ 2.76
Dynamic fatigue	Stress-corrosion parameter n_d	≥ 20
Operating temperature [°C]		–60 to +85
Average coating strip force (typ.) [N]		1.9

[1] Special attenuation cells on request.
[2] Attenuation values for 1383 nm represent values after hydrogen charging and are always lower or equal to the attenuation value for 1310 nm.
[3] Fiber attenuation in specified areas exceeds the nominal values at 1310/1550 nm no more than the declared value.
[4] M = 20, Q = 0.01 %
[5] Individual values can change during the cabling.

NOTE

This specification is valid as of 08/26/13, however, the specification is subject to change at any time.

Fischer CONNECTORS

LEONI **MULTIMODE 50µm OM3**

LEONI

50/125 µm j-BendAble / OptiGrade / GigaGrade		Multimode fiber specifications	Test methods	Industrial standards					
				IEC 60793-2-10	ISO/IEC 11801	ITU G651.1	TIA/EIA 492AAD OM4	TIA/EIA 492AAAC–B OM3	TIA/EIA 492AAAB–A OM2
Performance properties									
Attenuation [dB/KM]	at 850 nm	≤ 2.2 to ≤ 2.4	FOTP 78 IEC 60793-1-40	2.4 to 3.5 (A1a.1) 2.5 (A1a.2)	≤ 3.5 (cabled)	≤ 3.5 (cabled)	≤ 2.5	≤ 2.5	≤ 3.0
	at 1300 nm	≤ 0.6 to 0.7		0.7 to 1.5 (A1a.1) 0.8 (A1a.2)	≤ 1.5 (cabled)	≤ 1 (cabled)	≤ 0.8	≤ 0.8	≤ 1.0
	at 1385 nm (OH peak)	< 2.0		—	—	—	≤ 3.0	≤ 3.0	≤ 3.0
Discontinuity [dB]	at 850 nm	≤ 0.1	FOTP 78 IEC 60793-1-40	—	—	—	≤ 0.2	≤ 0.2	≤ 0.2
	at 1300 nm	≤ 0.1		—	—	—	≤ 0.2	≤ 0.2	≤ 0.2
Bend-induced attenuation [dB] for OptiGrade / GigaGrade									
100 turns Radius 37.5 mm	at 850 / 1300 nm	≤ 0.5	FOTP 62 IEC 60793-1-47	≤ 0.5	—	—	—	—	—
Bend-induced attenuation [dB] for j-Bendable									
100 turns Radius 37.5 mm	at 850 nm	≤ 0.05	FOTP 62 IEC 60793-1-47	≤ 0.5	—	—	—	—	—
	at 1300 nm	≤ 0.15		≤ 0.5	—	—	—	—	—
2 turns Radius 15 mm	at 850 nm	≤ 0.1		—	—	< 1	—	—	—
	at 1300 nm	≤ 0.3		—	—	< 1	—	—	—
2 turns Radius 7.5 mm	at 850 nm	≤ 0.2		—	—	—	—	—	—
	at 1300 nm	≤ 0.5		—	—	—	—	—	—

Modal bandwidth [MHz×km]		OM2	OM2+	OM3	OM4						
		Giga-Grade	OptiGrade / j-Bendable								
OFL	at 850 nm	≥ 500 to 600	≥ 750	≥ 1500	≥ 3500	FOTP 204 IEC 60793-1-41	200 to 800 (A1a.1) 1500 (A1a.2)	≥ 200 (OM1) ≥ 500 (OM2) ≥ 1500 (OM3) ≥ 3500 (OM4)	≥ 500	≥ 3500	≥ 1500	≥ 500
OFL	at 1300 nm	≥ 500 to 1200	≥ 500	≥ 500	≥ 500		500	≥ 500 (OM1/2/3/4)	≥ 500	≥ 500	≥ 500	≥ 500
EMB	at 850 nm	–	≥ 1000	≥ 2000	≥ 4700	FOTP 220 IEC 60793-1-49	≥ 2000 (A1a.2)	≥ 2000 (OM3)		≥ 4700	≥ 2000	
Transmission link length 1 Gb/s [m]	at 850 nm	550 to 750	750	1000	1100	—	—	—	—	—	—	—
	at 1300 nm	550 to 2000	550	550	550	—	—	—	—	—	—	—
Transmission link length 10 Gb/s [m]	at 850 nm	n.a.	150	300	550	—	—	—	—	—	—	—
	at 1300 nm	n.a.	300	300	300	—	—	—	—	—	—	—

Chromatic dispersion Slope at zero crossing of dispersion – λ_0 [nm]	1295≤ λ_0 ≤ 1340	FOTP 175 IEC 60793-1-32	1295≤ λ_0 ≤ 1340	—	1295≤ λ_0 ≤ 1340	1295≤ λ_0 ≤ 1340	1295≤ λ_0 ≤ 1340	1295≤ λ_0 ≤ 1340
Slope at zero crossing of dispersion – S_0 [ps/(nm²×km)] from 1295 ≤ λ_0 ≤ 1310 from 1310 ≤ λ_0 ≤ 1340	≤ 1.105 ≤ 0.000375×(1590-λ_0)		≤ 1.105 ≤ 0.000375×(1590-λ_0)	—	≤ 0.105 ≤ 0.000375 × (1590-λ_0)			

Geometrical properties									
Core Ø [µm]		50 ±2.5	FOTP 176 IEC 60793-1-20	50 ±2.5	50 ±2.5	50 ±3.0	50 ±2.5	50 ±2.5	50 ±3.0
Cladding Ø [µm]		125 ±1.0		125 ±2.0	125 ±2.0	125 ±2.0	125 ±2.0	125 ±2.0	125 ±2.0
Cladding non-circularity [%]		≤ 1.0		≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0
Core non-circularity [%]		≤ 5		≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Core/cladding concentricity error [µm]		≤ 1.5		≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0
Coating Ø [µm]		242 ±7	FOTP 176 IEC 60793-1-20	245 ±10	245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Numerical aperture		0.200 ±0.015	FOTP 177 IEC 60793-1-43	0.200 ±0.015	0.200 ±0.015	0.200 ±0.015	0.200 ±0.015	0.200 ±0.015	0.200 ±0.015
Length [km]	j-BendAble/ OptiGrade	1.1 to 8.8	Calibrated Winder IEC 60793-1-22	—	—	—	min. 1.1	min. 1.1	min. 1.1
	GigaGrade 50/125	1.1 to 17.6							
Proof test [GPa]	j-BendAble	≥ 200 (kpsi) ≥ 1.38 (GPa)	FOTP 31 IEC 60793-1-30	≥ 0.69	—	≥ 0.69	≥ 0.69	≥ 0.69	≥ 0.69
	OptiGrade/ GigaGrade	≥ 100 (kpsi) ≥ 0.69 (GPa)							
Coating strip force [N]	peak value	1.0 ≤ x ≤ 8.9	FOTP 178 IEC 60793-1-32	1.0 ≤ x ≤ 8.9	—	—	1.0 ≤ x ≤ 9.0	1.0 ≤ x ≤ 9.0	1.0 ≤ x ≤ 9.0
	average value	1.0 ≤ x ≤ 5.0		1.0 ≤ x ≤ 5.0	—	—	—	—	—

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NOTE

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LEONI **MULTIMODE 62.5µm OM1**

LEONI

62.5/125 µm GigaGrade		Multimode fiber specifications	Test methods	IEC 60793-2-10 A1b	ISO/IEC 11801	TIA/EIA 492AAAA-A (OM1)
Performance properties						
Attenuation [dB/KM]	at 850 nm	≤ 2.7 to ≤ 2.9	FOTP 78 IEC 60793-1-40	2.8 to 3.5	≤ 3.5 (cabled)	—
	at 1300 nm	≤ 0.6 to 0.7		0.7 to 1.5	≤ 1.5 (cabled)	—
	at 1385 nm (OH peak)	< 2.0		—	—	—
Discontinuity [dB]	at 850 nm	≤ 0.1	FOTP 78 IEC 60793-1-40	—	—	≤ 0.2
	at 1300 nm	≤ 0.1		—	—	≤ 0.2
Modal bandwidth [MHz×km]						
OFL	at 850 nm	≥ 200 to 300	FOTP 78 IEC 60793-1-41	100 to 800	≥ 200 (OM1)	≥ 200
OFL	at 1300 nm	≥ 500 to 1000		200 to 1000	≥ 500	≥ 500
Transmission link length 1 Gb/s [m]	at 850 nm	300	—	—	—	—
	at 1300 nm	500		—	—	—
Chromatic dispersion Zero crossing of dispersion $-\lambda_0$ [nm]		1320≤ λ_0 ≤ 1365	FOTP 175 IEC 60793-1-32	1320≤ λ_0 ≤ 1365	—	1320≤ λ_0 ≤ 1365
Slope at zero crossing of dispersion – S_0 [ps/(nm²×km)] from 1320 ≤ λ_0 ≤ 1345 from 1345 ≤ λ_0 ≤ 1365		≤ 0.11 ≤ 0.001×(1458-λ_0)		≤ 0.11 ≤ 0.001×(1458-λ_0)	—	≤ 0.11 ≤ 0.001×(1458-λ_0)
Geometrical properties						
Core Ø [µm]		62.5 ±2.5	FOTP 176 IEC 60793-1-20	62.5 ±3.0	62.5 ±3.0	62.5 ±3.0
Cladding Ø [µm]		125 ±1.0		125 ±2.0	125 ±2.0	125 ±2.0
Cladding non-circularity [%]		≤ 1.0		≤ 2.0	≤ 2.0	≤ 2.0
Core non-circularity [%]		≤ 5		≤ 6	≤ 6	≤ 6
Core/cladding concentricity error [µm]		≤ 1.5		≤ 3.0	≤ 3.0	≤ 3.0
Numerical aperture		0.275 ±0.015	FOTP 177 IEC 60793-1-43	0.275 ±0.015	0.275 ±0.015	0.275 ±0.015
Length [km]	GigaGrade 62.5/125	1.1 to 17.6	Calibrated Winder IEC 60793-1-22	—	—	min. 1.1
Proof test [GPa]	GigaGrade 62.5/125	≥ 100 (kpsi) ≥ 0.69 (GPa)	FOTP 31 IEC 60793-1-30	≥ 0.69	—	≥ 0.69
Coating strip force [N]	peak value	1.0 ≤ x ≤ 8.9	FOTP 178 IEC 60793-1-32	1.0 ≤ x ≤ 8.9	—	1.0 ≤ x ≤ 9.0
	average value	1.0 ≤ x ≤ 5.0		1.0 ≤ x ≤ 5.0	—	—

50/125 | 62.5/125 µm j-BendAble / OptiGrade / GigaGrade 50 / GigaGrade 62.5	Multimode fiber specifications	Test methods	Industrial standards					
			IEC 60793-2-10	ISO/IEC 11801	TIA/EIA 492AAD OM4	TIA/EIA 492AAAC–B OM3	TIA/EIA 492AAAB–A OM3	TIA/EIA 492AAAA–A OM1
Change of attenuation in environmental test [dB/km] at 850 nm and 1300 nm								
Damp heat attenaution increase 30 days at 85 °C / 85 % R.H.	≤ 0.10	FOTP 72 IEC 60793-1-50	≤ 0.20	—	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.20
Dry heat attenuation increase 30 days at 85 °C		FOTP 72 IEC 60793-1-51						
Change of temperature attenuation increase from –60 °C to +85 °C		FOTP 72 IEC 60793-1-52						
Water immersion attenuation increase, 30 days, 23 °C		FOTP 72 IEC 60793-1-53						

NOTE

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BRUGG **SINGLEMODE G.657.A1**

BRUGG CABLES Well connected.

Optical Single Mode Fibres

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

NOTE

BRUGG **MULTIMODE 50µm OM3**

BRUGG CABLES Well connected.

Optical Multi Mode Fibres

Fibre, multi-mode - application

2_1_32

Optimised for 10 Gigabit Ethernet application

Construction

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

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 (LA-SER) 850 nm	Numeric aper-ture	DMD character-istics
→ FG5M - OM3	≤2.7	≤0.9	≥1500	≥500	≥2000	0.200±0.02	TIA-492 AAAC
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-circu-larity %	Core/sheath con-centricity µm
→ FG5M - OM3	50±2.5	125±2.0	245±10	≤6	≤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
→ FG5M - OM3	x	x	x	x	x	x
FG5N - OM4	x	x	x	x	x	x

NOTE

BRUGG **MULTIMODE 62.5 µm OM1**

BRUGG CABLES Well connected.

Optical Multi Mode Fibres

Fibre, multi-mode - standard

2_1_30_1

For standard LAN applications

Construction

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

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	Numeric aperture
FG5 - OM2	≤2.7	≤0.8	≥500	≥800	0.200±0.02
FG5F - OM2	≤2.5	≤0.7	≥600	≥1200	0.200±0.02
FG6 - OM1	≤3.5	≤1.0	≥200	≥500	0.275±0.02
→ FG6A - OM1	≤3.0	≤0.8	≥250	≥800	0.275±0.02

Geometric values

Type	Core Ø µm	Cladding Ø µm	Primary coating ø µm	Core non-circularity %	Cladding non-circularity %	Core/sheath concentricity µm
FG5 - OM2	50±3	125±2	250±15	≤6	≤2	≤1.5
FG5F - OM2	50±3	125±2	250±15	≤6	≤2	≤1.5
FG6 - OM1	62.5±3	125±2	250±15	≤6	≤2	≤1.5
→ FG6A - OM1	62.5±3	125±2	250±15	≤6	≤2	≤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
FG5 - OM2	x	x	x	x	x
FG5F - OM2	x	x	x	x	x
FG6 - OM1			x	x	x
→ FG6A - OM1			x	x	x

NOTE

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