

Flat FRP Drop Cable up to 4 Fibers

Design Type U-N(ZM)H Universal 2.0x3.0 mm

Properties

- Completely dry design
- 1-2-4 Fibers Option
- Enforced with FRP Strength Member
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

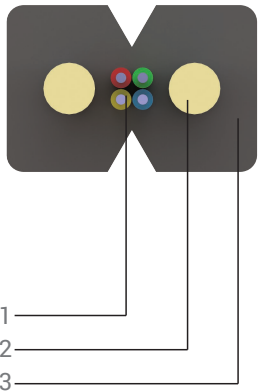
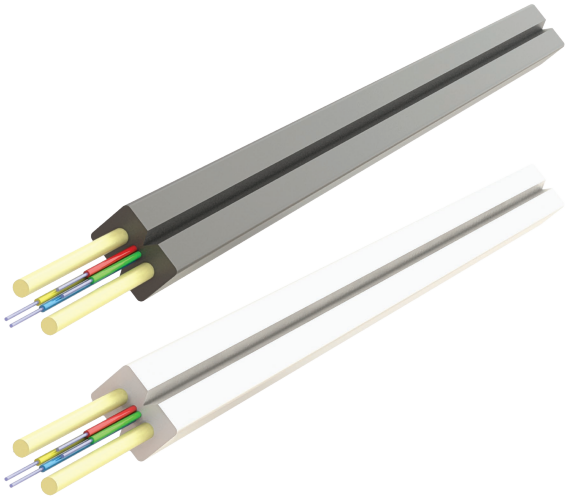
1 Fiber	SM (250 μ)
2 Strength Member	FRP
3 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type	A2	Unit
Jacket Color	Black	-
Core Diameter (μm)	9.0 ±0.5	μm
Cladding Diameter (μm)	125 ±5.0	μm
Primary Coating Diameter (μm)	245 ±10	μm
Attenuation	≤ 0.40 (850 nm)	dB/km
max. in cable)	≤ 0.30 (1300 nm)	dB/km



Flame Retardant



All Dry Materials



All Dielectric Construction

Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Fiber Diameter	-	0.25	mm	IEC 60811-203
FRP Diameter	-	0.5 ± 10%	mm	IEC 60811-203
Outer Jacket Diameter	-	2.0 x 3.0	mm	IEC 60811-203
Approx. Weight	-	10.0 ± 10%	kg/km	-
Max. Tensile Strength	During installation	100	N	IEC 60794-1-2 E1
	In service	40		
Min. Bending Radius	During installation	20	mm	IEC 60794-1-2 E11
	In service	15		
Crush Resistance	Short term	4000	N/dm	IEC 60794-1-2 E3
	Long term	2000		
Impact Resistance	Wp=5J	3	impact	IEC 60794-1-2 E4
Repeated Bending	r=100mm, 1 kg	100	cycles	IEC 60794-1-2 E6
Temperature Range	During installation	+5 to +50		IEC 60794-1-22 F1
	In service	-30 to +70	°C	
	In storage	-30 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 02 - FD - 2030 - B25 - A2 - H - BK							
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Color
Universal: U	1 Fiber: 01 2 Fibers: 02 4 Fibers: 04	FRP Drop: FD	2.0x3.0 mm: 2030	Bare Fiber 250µm: B25	SM G.657 A2: A2	LSZH: H	Black: BK A2 White: WH A2

Messenger Flat FRP Drop Cable up to 4 Fibers

Design Type A-N(ZM)H-SH Outdoor 2.0x5.2 mm

Properties

- Completely dry design
- 1-2 Fibers Option
- Enforced with FRP Strength Member
- Steel Messenger Wire
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

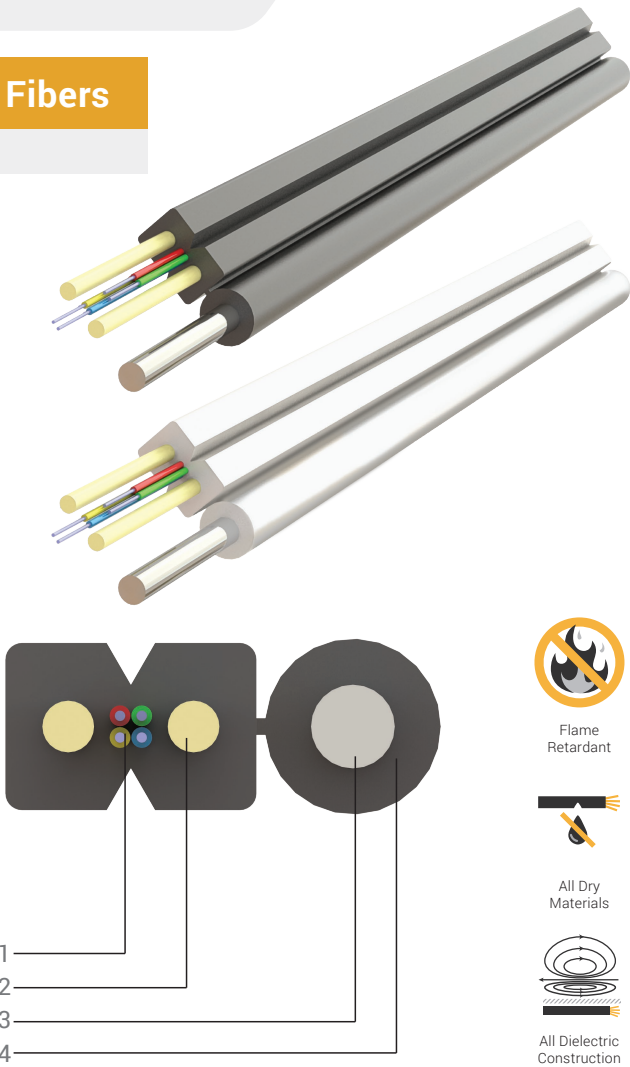
1 Fiber	SM (250 μ)
2 Strength Member	FRP
3 Messenger Wire	FeZn Wire
4 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type	A2	Unit
Jacket Color	Black	-
Core Diameter (μm)	9.0 ±0.5	μm
Cladding Diameter (μm)	125 ±5.0	μm
Primary Coating Diameter (μm)	245 ±10	μm
Attenuation	≤ 0.40 (850 nm)	dB/km
max. in cable)	≤ 0.30 (1300 nm)	dB/km



Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Fiber Diameter	-	0.25	mm	IEC 60811-203
FRP Diameter	-	0.5 ± 10%	mm	IEC 60811-203
Steel Wire Diameter	-	1.0 ± 10%	mm	IEC 60811-203
Outer Jacket Diameter	-	2.0 x 5.2	mm	IEC 60811-203
Approx. Weight	-	20 ± 10%	kg/km	-
Max. Tensile Strength	During installation	600	N	IEC 60794-1-2 E1
	In service	300		
Min. Bending Radius	During installation	20	mm	IEC 60794-1-2 E11
	In service	15		
Crush Resistance	Short term	4000	N/dm	IEC 60794-1-2 E3
	Long term	2000		
Impact Resistance	Wp=5J	3	impact	IEC 60794-1-2 E4
Repeated Bending	r=120mm, 1 kg	10	cycles	IEC 60794-1-2 E6
Temperature Range	During installation	+5 to +50	°C	IEC 60794-1-22 F1
	In service	-30 to +70		
	In storage	-30 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

0 - 02 - SF - 2052 - B25 - A2 - H - YE							
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Color
Outdoor: O	1 Fiber: 01 2 Fibers: 02 4 Fibers: 04	Steel Wire and FRP: SF	2.0x5.2 mm: 2052	Bare Fiber 250µm: B25	SM G.657 A2: A2	LSZH: H	Black: BK A2

Flat Steel Drop Cable up to 4 Fibers

Design Type U-N(ZM)H Universal 2.0x3.0 mm

Properties

- Completely dry design
- 1-2-4 Fibers Option
- Enforced with Steel Wire Strength Member
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

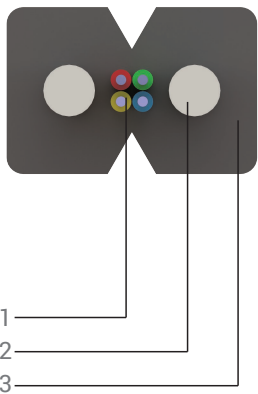
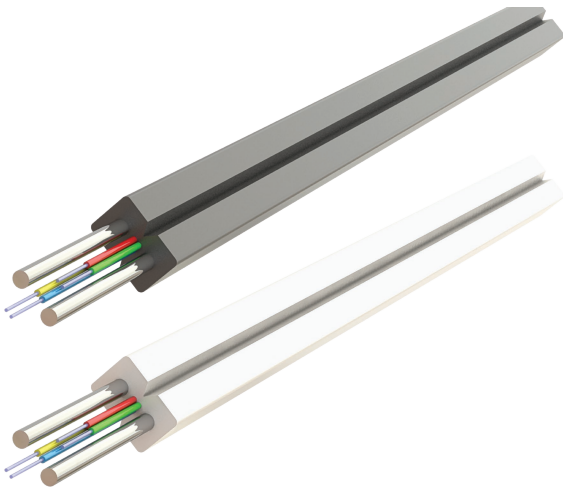
1 Fiber	SM (250 μ)
2 Strength Member	FeZn Wire
3 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type	A2	Unit
Jacket Color	Black or White	-
Core Diameter (μm)	9.0 ±0.5	μm
Cladding Diameter (μm)	125 ±5.0	μm
Primary Coating Diameter (μm)	245 ±10	μm
Attenuation	≤ 0.40 (850 nm)	dB/km
max. in cable)	≤ 0.30 (1300 nm)	dB/km



Flame Retardant



All Dry Materials



All Dielectric Construction

Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Fiber Diameter	-	0.25	mm	IEC 60811-203
FRP Diameter	-	0.5 ± 10%	mm	IEC 60811-203
Outer Jacket Diameter	-	2.0 x 3.0	mm	IEC 60811-203
Approx. Weight	-	10.0 ± 10%	kg/km	-
Max. Tensile Strength	During installation	200	N	IEC 60794-1-2 E1
	In service	100		
Min. Bending Radius	During installation	20	mm	IEC 60794-1-2 E11
	In service	15		
Crush Resistance	Short term	4000	N/dm	IEC 60794-1-2 E3
	Long term	2000		
Impact Resistance	Wp=2,21J	3	impact	IEC 60794-1-2 E4
Repeated Bending	r=100mm, 1 kg	100	cycles	IEC 60794-1-2 E6
Temperature Range	During installation	+5 to +50		IEC 60794-1-22 F1
	In service	-30 to +70	°C	
	In storage	-30 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 02 - SD - 2030 - B25 - A2 - H - BK							
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Color
Universal: U	1 Fiber: 01 2 Fibers: 02 4 Fibers: 04	Steel Drop: SD	2.0x3.0 mm: 2030	Bare Fiber 250µm: B25	SM G.657 A2: A2	LSZH: H	Black: BK A2 White: WH A2

Messenger Flat Steel Drop Cable up to 4 Fibers

Design Type A-N(ZM)H-SH Outdoor 2.0x5.2 mm

Properties

- Completely dry design
- 1-2 Fibers Option
- Enforced with Steel Strength Member
- Steel Messenger Wire
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

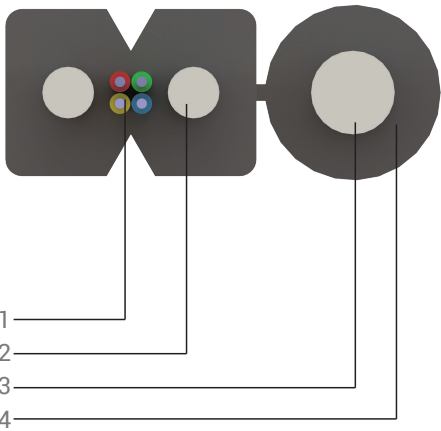
1 Fiber	SM (250 μ)
2 Strength Member	FeZn Wire
3 Messenger Wire	FeZn Wire
4 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type	A2	Unit
Jacket Color	Black	-
Core Diameter (μm)	9.0 ±0.5	μm
Cladding Diameter (μm)	125 ±5.0	μm
Primary Coating Diameter (μm)	245 ±10	μm
Attenuation	≤ 0.40 (850 nm)	dB/km
max. in cable)	≤ 0.30 (1300 nm)	dB/km



Flame Retardant



All Dry Materials



All Dielectric Construction

Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Fiber Diameter	-	0.25	mm	IEC 60811-203
FRP Diameter	-	0.5 ± 10%	mm	IEC 60811-203
Steel Wire Diameter	-	1.0 ± 10%	mm	IEC 60811-203
Outer Jacket Diameter	-	2.0 x 5.2	mm	IEC 60811-203
Approx. Weight	-	20 ± 10%	kg/km	-
Max. Tensile Strength	During installation	800	N	IEC 60794-1-2 E1
	In service	400		
Min. Bending Radius	During installation	20	mm	IEC 60794-1-2 E11
	In service	15		
Crush Resistance	Short term	4000	N/dm	IEC 60794-1-2 E3
	Long term	2000		
Impact Resistance	Wp=5J	3	impact	IEC 60794-1-2 E4
Repeated Bending	r=120mm, 1 kg	10	cycles	IEC 60794-1-2 E6
Temperature Range	During installation	+5 to +50	°C	IEC 60794-1-22 F1
	In service	-30 to +70		
	In storage	-30 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

0 - 02 - SS - 2052 - B25 - A2 - H - BK

Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Color
Outdoor: O	1 Fiber: 01 2 Fibers: 02 4 Fibers: 04	Steel Wire and Steel: SS	2.0x5.2 mm: 2052	Bare Fiber 250µm: B25	SM G.657 A2: A2	LSZH: H	Black: BK A2

Distribution Cable up to 24 Fibers

Design Type U-(ZN)H Universal 4.8 mm

Properties

- Metal free universal cable
- Completely dry design
- For direct connector assembly
- High flexibility and light weight
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- Jacket material in accordance with UL 94V-0
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

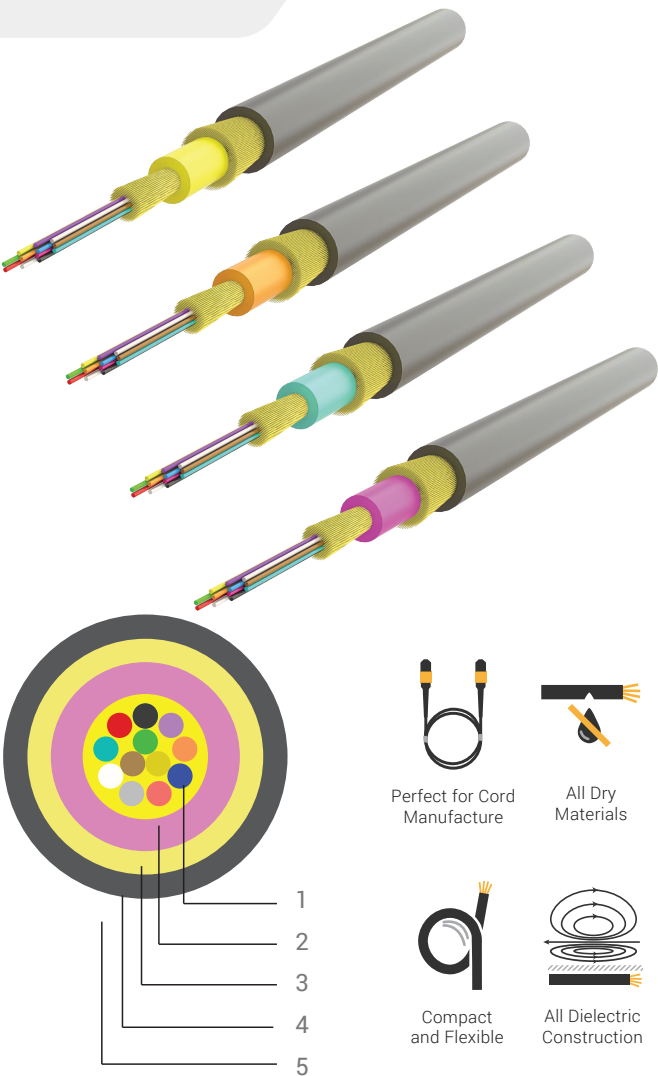
1 Fiber	SM or MM (250 µ)
2 Strength Member	Aramid yarn
3 Inner Jacket	LSZH
4 Strength Member	Swellable Aramid Yarn
5 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black	Black	Black	Black	Black
Core Diameter (µm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (µm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (µm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet 1 Gigabit	@850 nm	-	-	-	1000 meters	1040 meters
	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet 10 Gigabit	@850 nm	-	-	-	300 meters	550 meters
	@1300 nm	-	-	-	300 meters	300 meters



Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Jacket Diameter	-	4.8	mm	-
Approx. Weight	-	23	kg/km	-
Max. Tensile Strength	During installation	800	N	IEC 60794-1-2 E1
	In service	500		
Min. Bending Radius	During installation	100	mm	IEC 60794-1-2 E11
	In service	70		
Crush Resistance	Short term	5000	N/dm	IEC 60794-1-2 E3
	Long term	500		
Impact Resistance	Wp=2.21 J	50	impact	IEC 60794-1-2 E4
Temperature Range	During installation	-10 to +50	°C	IEC 60794-1-22 F12
	In service	-20 to +70		
	In storage	-20 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.10	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 12 - MF - 48 - A2 - H - H - BK							
Type	Fiber Count	Cable Type	Diameter	Fiber Type	Sheath	Sheath	Color
Universal: U	8 Fibers: 08 12 Fibers: 12 24 Fibers: 24	Multi-fiber: MF	4.8 mm: 48	SM G.657 A2: A2 SM G.657 B3: B3 MM G.651 OM1: M1 MM G.651 OM2: M2 MM G.651 OM3: M3 MM G.651 OM4: M4	LSZH: H	LSZH: H	Black: BK A2 Black: BK B3 Black: BK M1 Black: BK M2 Black: BK M3 Black: BK M4

Mini Breakout Cable 2 Fibers

Design Type U-V(BN)H Universal 4.8 mm

Properties

- Metal free indoor and outdoor cable
- Completely dry design
- Water swellable glass yarn strength member
- Rodent protected with glass armour
- For direct connector assembly
- For vertical applications
- High flexibility and light weight
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

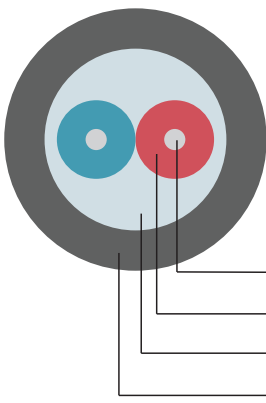
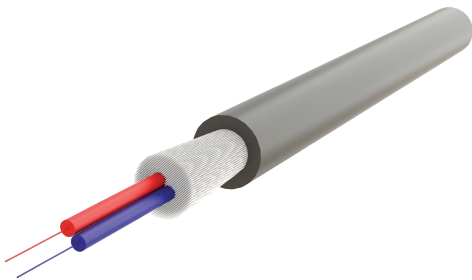
1 Fiber	SM or MM (250 µ)
2 Tight Buffer Tube	900µ LSZH
3 Strength Member	Swellable Glass Yarn
4 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black	Black	Black	Black	Black
Core Diameter (µm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (µm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (µm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	-	1000 meters	1040 meters
1 Gigabit	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet	@850 nm	-	-	-	300 meters	550 meters
10 Gigabit	@1300 nm	-	-	-	300 meters	300 meters



Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Tight Diameter	-	0.9	mm	IEC 60811-203
Cable Diameter	-	4.8 ±0.1	mm	IEC 60811-203
Approx. Cable Weight	-	27	kg/km	-
Max. Tensile Strength	During Installation	800	N	IEC 60794-1-2 E1
	In Service	500		
Min. Bending Radius	During Installation	100	mm	IEC 60794-1-2 E11
	In Service	70		
Crush Resistance	ShortTerm	4000	N/dm	IEC 60794-1-2 E3
	LongTerm	1500		
Water Penetration	h=1m, 24 h, l=3m	passed	-	IEC 60794-1-2 F5B
Temperature Range	During installation	-40 to +70		IEC 60794-1-22 F1
	In service	-40 to +75	°C	
	In storage	-40 to +75		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	0.46	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 02 - RI - 48 - S9H - M2 - H - BK							
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Color
Universal: U	2 Fibers: 02	Riser: RI	4.8 mm: 48	S-Tight 900µm: S9H Tight 900µm: T9H	SM G.657 A2: A2 SM G.657 B3: B3 MM G.651 OM1: M1 MM G.651 OM2: M2 MM G.651 OM3: M3 MM G.651 OM4: M4	LSZH: H	Black: BK A2 Black: BK B3 Black: BK M1 Black: BK M2 Black: BK M3 Black: BK M4

Breakout Cable 2 Fibers

Design Type U-V(ZN)H(BN)H Universal 7.0 mm

Properties

- Metal free indoor and outdoor cable
- Completely dry design
- Rodent-protected with glass-armoured
- For direct connector assembly with strain relief
- High flexibility and light weight
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

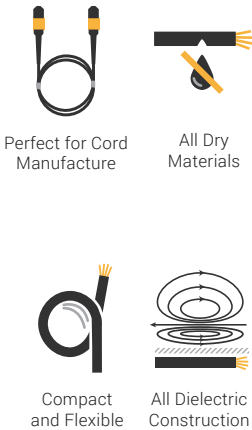
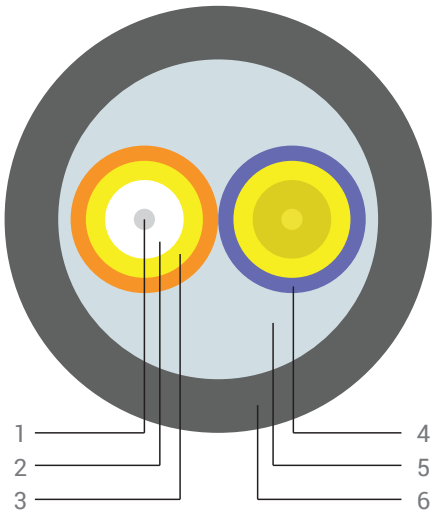
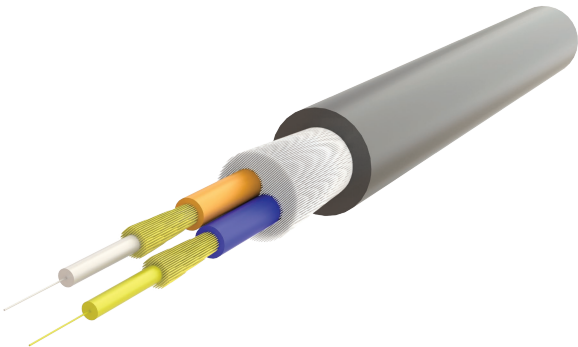
1 Fiber	SM or MM (250 μ)
2 Tight Buffer Tube	900μ LSZH
3 Strength Member	Aramid
4 Inner Jacket	LSZH
5 Strength Member	Swellable Glass Yarn
6 Outer Jacket	LSZH - FR, UV Resistant

Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM2
Jacket Color		Black	Black
Core Diameter (μm)		9.0 ±0.5	50 ±2.5
Cladding Diameter (μm)		125 ±5.0	125 ±5.0
Primary Coating Diameter (μm)		245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	-	-
	@1550 nm	-	-
	@850 nm	≤ 0.40	≤ 3.0
	@1300 nm	≤ 0.30	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	500 Mhz*km
	@1300 nm	-	500 Mhz*km
Serial Ethernet	@850 nm	-	-
1 Gigabit	@1300 nm	-	-
Serial Ethernet	@850 nm	-	-
10 Gigabit	@1300 nm	-	-



Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Tight Diameter	-	0.9	mm	IEC 60811-203
Single Cable Diameter	-	2.0 ± 0.1	mm	IEC 60811-203
Jacket Diameter	-	7.0 ± 0.2	mm	IEC 60811-203
Approx. Weight	-	55 ± 5	kg/km	-
Max. Tensile Strength	During installation	1600	N	IEC 60794-1-2 E1
	In service	800		
Min. Bending Radius	During installation	40	mm	IEC 60794-1-2 E11
	In service	25		
Crush Resistance	Short term	3000	N/dm	IEC 60794-1-2 E3
	Long term	1500		
Impact Resistance	Wp=2,21J	50	impact	IEC 60794-1-2 E4
Repeated Bending	r=20mm, 1 kg	1000	cycles	IEC 60794-1-2 E6
Torsion	±360°	10	cycles	IEC 60794-1-2 E7
Water Penetration	L=1m, 24 h, p<3m	passed	-	IEC 60794-1-2 F5A
Temperature Range	During installation	-10 to +50		IEC 60794-1-22 F1
	In service	-30 to +70	°C	
	In storage	-40 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 02 - B20 - 70 - S9H - M2 - H - H - BK								
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Sheath Mat.	Color
Universal: U	2 Fibers: 02	Breakout 2mm: B20	7.0 mm: 70	S-Tight 900µm: S9H	SM G.657 A2: A2 SM G.657 B3: B3 MM G.651 OM2: M2	LSZH: H	LSZH: H	Black: BK A2 Black: BK B3 Black: BK M2

Ruggedized Breakout Fiber Cable

Design Type U-V(ZN)H(ZN)H(ZN)BH Universal 8.2 mm

Properties

- Metal free indoor and outdoor cable
- Completely dry design
- Rodent-protected with glass-armoured
- For direct connector assembly with strain relief
- High flexibility and light weight
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- LSZH - FR, UV Resistant Outer Jacket

Cable Construction

1 Fiber	SM or MM (250 μ)
2 Tight Buffer Tube	900μ LSZH
3 Strength Member	Swellable Aramid
4 Sub-unit Jacket	LSZH
5 Strength Member	Swellable Glass Yarn
6 Inner Jacket	LSZH - FR, UV Resistant
7 Strength Member	Swellable Glass Yarn
8 Outer Jacket	LSZH - FR, UV Resistant



Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		A2	OM2	OM3
Jacket Color		Black	Black	Black
Core Diameter (μm)		9.0 ±0.5	50 ±2.5	50 ±2.5
Cladding Diameter (μm)		125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (μm)		245 ±10	245 ±10	245 ±10
Attenuation (dB/km)	@850 nm	≤ 0.40	≤ 3.0	≤ 3.0
	(max. in cable) @1300 nm	≤ 0.30	≤ 1.0	≤ 1.0
Bandwidth	@850 nm	-	500 Mhz*km	1500 Mhz*km
	(overfilled) @1300 nm	-	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	1000 meters
1 Gigabit	@1300 nm	-	-	600 meters
Serial Ethernet	@850 nm	-	-	300 meters
10 Gigabit	@1300 nm	-	-	300 meters

Mechanical and Environmental Properties

Test	Test Conditions	Value	Unit	Method
Tight Buffer Diameter	-	0.9	mm	IEC 60811-203
Sub-unit Diameter	-	2.0 ± 0.1	mm	IEC 60811-203
Inner Jacket Diameter	-	5.7 ± 0.1	mm	IEC 60811-203
Outer Jacket Diameter	-	8.2 ± 0.2	mm	IEC 60811-203
Approx. Weight	-	70 ± 10%	kg/km	-
Max. Tensile Strength	During installation	2000	N	IEC 60794-1-2 E1
	In service	1500		
Min. Bending Radius	During installation	120	mm	IEC 60794-1-2 E11
	In service	80		
Crush Resistance	Short term	3000	N/dm	IEC 60794-1-2 E3
	Long term	1500		
Impact Resistance	Wp=2,21J	50	impact	IEC 60794-1-2 E4
Repeated Bending	r=120mm, 1 kg	10	cycles	IEC 60794-1-2 E6
Torsion	±360°	10	cycles	IEC 60794-1-2 E7
Water Penetration	L=1m, 24 h, p<1m	passed	-	IEC 60794-1-2 F5A
Temperature Range	During installation	+5 to +50	°C	IEC 60794-1-22 F1
	In service	-40 to +70		
	In storage	-40 to +70		

Combustion Properties

Fiber Type	Test Conditions	Value	Unit	Result	Method
Fire Load	-	1.15	Mj/m	-	-
Fire Propagation	On a vertical single cable	-	-	passed	IEC 60332-1-2
Smoke Density	-	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	-	-	passed	IEC 60754-2

Cable Coding System

U - 02 - B20 - 82 - T9H - M2 - H - H - H - BK									
Type	Fiber Count	Cable Type	Diameter	Buffer Type	Fiber Type	Sheath Mat.	Sheath Mat.	Sheath Mat.	Color
Universal: U	2 Fibers: 02	Breakout 2mm: B20	8.2 mm: 82	Tight 900µm: T9H	SM G.657 A2: A2 MM G.651 OM2: M2 MM G.651 OM3: M3	LSZH: H	LSZH: H	LSZH: H	Black: BK A2 Black: BK B3 Black: BK M2

Gel-Filled Central Loose Tube Cable up to 24 Fibers

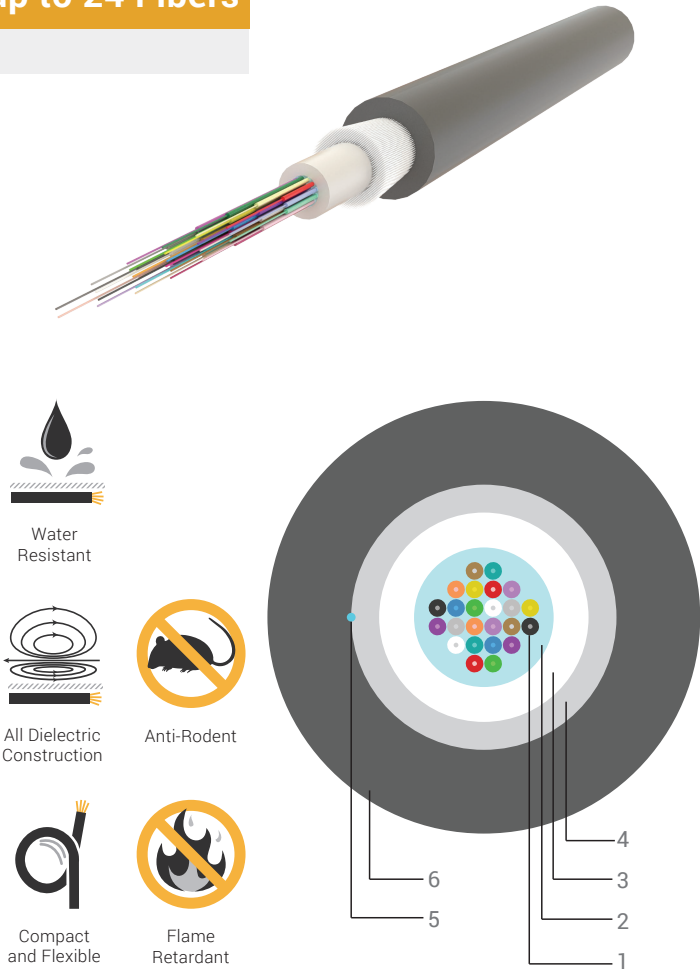
Design Type A-DQ(BN)2Y Indoor/Outdoor

Properties

- Metal free outdoor cable
- Glass yarn strength member
- Ripcord for easy stripping
- Gel filled tube
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- Longitudinal and transversal watertight cable

Cable Construction

- | | |
|-------------------------|----------------------|
| 1 Fiber | SM (250 μ) |
| 2 Tube Filling Material | Thixotropic Gel |
| 3 Loose Tube | PBT |
| 4 Strength Member | Swellable Glass Yarn |
| 5 Ripcord | Polyester |
| 6 Outer Sheath | UV Resistant PE |



Sheath Marking

- | | | |
|--------------------|---|--------------------------------|
| Print Color/Method | White / Ink-Jet | (length marking 1 m intervals) |
| Cable Printing | Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking | |

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black	Black	Black	Black	Black
Tube Diameter (μm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (μm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (μm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	-	1000 meters	1040 meters
1 Gigabit	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet	@850 nm	-	-	-	300 meters	550 meters
10 Gigabit	@1300 nm	-	-	-	300 meters	300 meters

Mechanical and Environmental Properties

Test	Test Conditions	Value		Unit	Method
Fiber Count	-	4-12F	24F	-	-
Tube Diameter	-	2.5 ±3%	3.0 ±3%	mm	IEC 60811-203
Approx. Cable Diameter	-	5.1 ±0.2	5.8 ±0.2	mm	IEC 60811-203
Approx. Cable Weight	-	25 ±10%	28 ±10%	kg/km	
Max. Tensile Strength	During Installation (Loaded)	1200		N	IEC 60794-1-2 E1
	In Service (Unloaded)	600			
Min. Bending Radius	During Installation (Loaded)	115		mm	IEC 60794-1-2 E11
	In Service (Unloaded)	85			
Crush Resistance	ShortTerm	1500		N/dm	IEC 60794-1-2 E3
	LongTerm	800			
Impact Resistance	Wp=1.5J	3		Impact	IEC 60794-1-2 E4
Repeated Bending	r=20xD	25		cycles	IEC 60794-1-2 E6
Water Penetration	h=1m, 48h, p < 3m	passed		-	IEC 60794-1-22 F5B
Temperature Range	During installation	-10 to +50		°C	IEC 60794-1-22 F1
	In service	-40 to +70			
	In storage	-40 to +80			

Combustion Properties

Fiber Type	Test Conditions	Type	Value	Unit	Result	Method
Fire Load	-	All types	1.3	Mj/m	-	-
Fire Propagation	On a vertical single cable	All types	-	-	passed	IEC 60332-1-2
Smoke Density	-	All types	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	All types	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	All types	-	-	passed	IEC 60754-2

Cable Coding System

O - 24 - DI - 51 - CLT - A2 - P - BK							
Type	Fiber Count	Cable Type	Diameter	Tube Type	Fiber Type	Sheath Mat.	Color
Outdoor: O	4 Fiber: 04 6 Fiber: 06 8 Fiber: 08 12 Fiber: 12 24 Fiber: 24	Distribution: DI	5.1 mm: 51 5.8 mm: 58	Central Loose Tube: CLT	SM G.657 A2: A2 SM G.657 B3: B3 MM G.651 OM1: M1 MM G.651 OM2: M2 MM G.651 OM3: M3 MM G.651 OM4: M4	Polyethylene: P	Black: BK A2 Black: BK B3 Black: BK M1 Black: BK M2 Black: BK M3 Black: BK M4

Gel-Free Central Loose Tube Cable up to 24 Fibers

Design Type U-BQ(BN)H Indoor/Outdoor

Properties

- Metal free indoor and outdoor cable
- Glass yarn strength member
- Dry tube (Gel-Free)
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable

Cable Construction

1 Fiber	SM (250 μ)
2 Tube Filling Compound	Water Swellable Yarn
3 Loose Tube	LSZH
4 Strength Member	Swellable Glass Yarn
5 Outer Sheath	UV Resistant LSZH

Sheath Marking

Print Color/Method	Black Jacket: White / Ink-Jet , Other Colors: Black / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black or Yellow	Orange	Orange	Aqua	Violet
Tube Diameter (μm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (μm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (μm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	-	1000 meters	1040 meters
1 Gigabit	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet	@850 nm	-	-	-	300 meters	550 meters
10 Gigabit	@1300 nm	-	-	-	300 meters	300 meters

Mechanical and Environmental Properties

Test	Test Conditions	Value		Unit	Method
Fiber Count	-	4-12F	24F	-	-
Tube Diameter	-	2.5 ±3%	3.0 ±3%	mm	IEC 60811-203
Approx. Cable Diameter	-	6.1 ±0.2	6.5 ±0.2	mm	IEC 60811-203
Approx. Cable Weight	-	45 ±10%	50 ±10%	kg/km	
Max. Tensile Strength	During Installation (Loaded)	1200		N	IEC 60794-1-2 E1
	In Service (Unloaded)	600			
Min. Bending Radius	During Installation (Loaded)	115		mm	IEC 60794-1-2 E11
	In Service (Unloaded)	85			
Crush Resistance	ShortTerm	2000		N/dm	IEC 60794-1-2 E3
	LongTerm	800			
Impact Resistance	Wp=1.5J	3		Impact	IEC 60794-1-2 E4
Repeated Bending	r=20xD	25		cycles	IEC 60794-1-2 E6
Water Penetration	h=1m, 48h, p < 3m	passed		-	IEC 60794-1-22 F5B
Temperature Range	During installation	0 to +50		°C	IEC 60794-1-22 F1
	In service	-20 to +60			
	In storage	-40 to +70			

Combustion Properties

Fiber Type	Test Conditions	Type	Value	Unit	Result	Method
Fire Load	-	All types	1.5	Mj/m	-	-
Fire Propagation	On a vertical single cable	All types	-	-	passed	IEC 60332-1-2
Smoke Density	-	All types	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	All types	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	All types	-	-	passed	IEC 60754-2

Cable Coding System

U - 12 - DI - 61 - CDT - A2 - H - BK							
Type	Fiber Count	Cable Type	Diameter	Tube Type	Fiber Type	Sheath Mat.	Color
Universal: U	4 Fiber: 04 6 Fiber: 06 8 Fiber: 08 12 Fiber: 12 24 Fiber: 24	Distribution: DI	6.1 mm: 61 6.5 mm: 65	Central Dry Loose Tube: CDT	SM G.652 D: 2D SM G.657 A2: A2 MM G.651 OM1: M1 MM G.651 OM2: M2 MM G.651 OM3: M3 MM G.651 OM4: M4	LSZH: H	Black: BK SM Yellow: YE SM Orange: OG M1 Orange: OG M2 Aqua: AQ M3 Violet: VI M4

Steel-Armoured Gel-Filled
Central Loose Tube Cable up to 24 Fibers

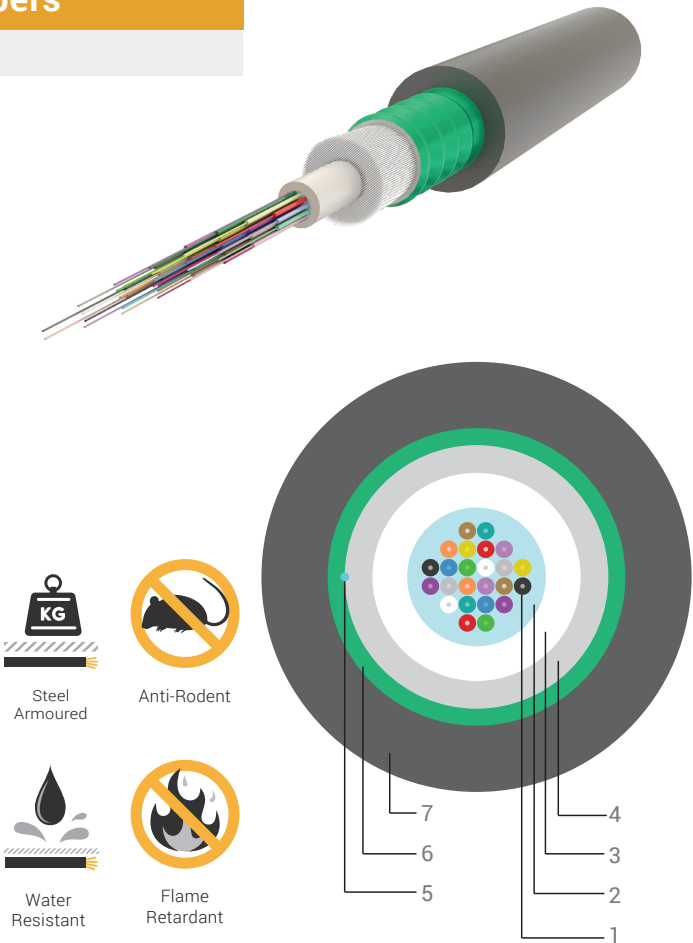
Design Type A-DQ(ZN)(SR)2Y Outdoor

Properties

- Corrugated Steel Armoured Outdoor Cable
- Glass yarn strength member
- Ripcord for easy stripping
- Gel filled tube
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- Longitudinal and transversal watertight cable

Cable Construction

1 Fiber	SM (250 µ)
2 Tube Filling Material	Thixotropic Gel
3 Loose Tube	PBT
4 Strength Member	Swellable Glass Yarn
5 Ripcord	Polyester
6 Armoured Material	Corrugated Steel
7 Outer Sheath	UV Resistant PE



Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black	Black	Black	Black	Black
Tube Diameter (µm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (µm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (µm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	-	1000 meters	1040 meters
1 Gigabit	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet	@850 nm	-	-	-	300 meters	550 meters
10 Gigabit	@1300 nm	-	-	-	300 meters	300 meters

Mechanical and Environmental Properties

Test	Test Conditions	Value		Unit	Method
Fiber Count	-	4-12F	24F	-	-
Tube Diameter	-	2.5 ±3%	3.0 ±3%	mm	IEC 60811-203
Approx. Cable Diameter	-	8.0 ±0.2	8.2 ±0.2	mm	IEC 60811-203
Approx. Cable Weight	-	68 ±10%	76 ±10%	kg/km	
Max. Tensile Strength	During Installation (Loaded)	1000		N	IEC 60794-1-2 E1
	In Service (Unloaded)	400			
Min. Bending Radius	During Installation (Loaded)	20xD		mm	IEC 60794-1-2 E11
	In Service (Unloaded)	15xD			
Crush Resistance	ShortTerm	1500		N/dm	IEC 60794-1-2 E3
	LongTerm	800			
Impact Resistance	Wp=1.5J	3		Impact	IEC 60794-1-2 E4
Repeated Bending	r=20xD	35		cycles	IEC 60794-1-2 E6
Water Penetration	h=1m, 48h, p < 3m	passed		-	IEC 60794-1-22 F5B
Temperature Range	During installation	-30 to +60		°C	IEC 60794-1-22 F1
	In service	-20 to +70			
	In storage	0 to +70			

Combustion Properties

Fiber Type	Test Conditions	Type	Value	Unit	Result	Method
Fire Load	-	All types	1.3	Mj/m	-	-
Fire Propagation	On a vertical single cable	All types	-	-	passed	IEC 60332-1-2
Smoke Density	-	All types	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	All types	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	All types	-	-	passed	IEC 60754-2

Cable Coding System

O - 24 - DI - 82 - SCL - DD - H - BK									
Type	Fiber Count		Cable Type	Diameter		Tube Type	Fiber Type	Sheath Mat.	Color
Outdoor: O	4 Fiber:	04	Distribution: DI	8.0 mm:	80	Steel Armoured Central Loose Tube: SCL	SM G.652 D: DD	Polyethylene: P	Black: BK DD
	6 Fiber:	06		8.2 mm:	82		SM G.657 A2: A2		Black: BK A2
	8 Fiber:	08					SM G.657 B3: B3		Black: BK B3
	12 Fiber:	12					MM G.651 OM1: M1		Black: BK M1
	24 Fiber:	24					MM G.651 OM2: M2		Black: BK M2
							MM G.651 OM3: M3		Black: BK M3
							MM G.651 OM4: M4		Black: BK M4

Steel-Armoured Gel-Free
Central Loose Tube Cable up to 24 Fibers

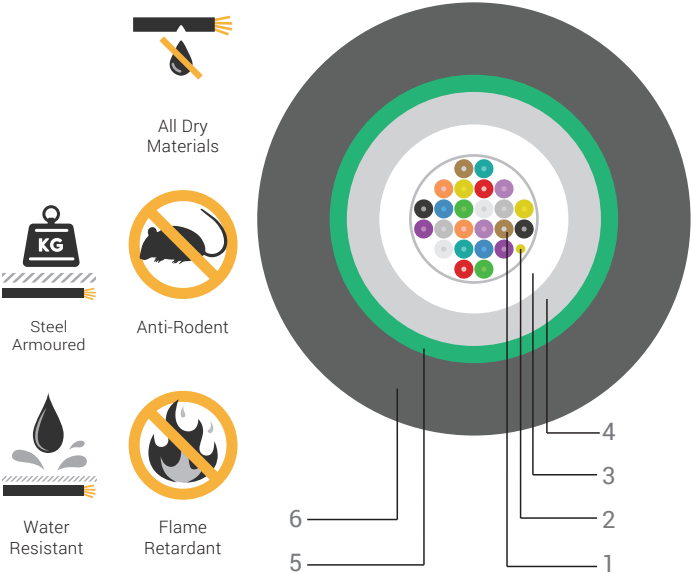
Design Type A-BQ(ZN)(SR)H Outdoor

Properties

- Corrugated Steel Armoured Outdoor Cable
- Glass yarn strength member
- Dry tube (Gel-Free)
- Halogen free and non-corrosive fire gases
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable

Cable Construction

1 Fiber	SM (250 μ)
2 Tube Filling Compound	Water Swellable Yarn
3 Loose Tube	LSZH
4 Strength Member	Swellable Glass Yarn
5 Armoured Material	Corrugated Steel
6 Outer Sheath	UV Resistant LSZH



Sheath Marking

Print Color/Method	White / Ink-Jet	(length marking 1 m intervals)
Cable Printing	Manufacturer name, fiber count, fiber type, product code, cable type, date, meter marking	

Optical Characteristics and Physical Properties

Fiber Type		SM	OM1	OM2	OM3	OM4
Jacket Color		Black	Orange	Orange	Aqua	Violet
Tube Diameter (μm)		9.0 ±0.5	62.5 ±2.5	50 ±2.5	50 ±2.5	50 ±2.5
Cladding Diameter (μm)		125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0	125 ±5.0
Primary Coating Diameter (μm)		245 ±10	245 ±10	245 ±10	245 ±10	245 ±10
Attenuation (max. in cable) (dB/km)	@1310 nm	≤ 0.40	-	-	-	-
	@1550 nm	≤ 0.30	-	-	-	-
	@850 nm	-	≤ 3.4	≤ 3.0	≤ 3.0	≤ 3.0
	@1300 nm	-	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Bandwidth (overfilled)	@850 nm	-	200 Mhz*km	500 Mhz*km	1500 Mhz*km	3500 Mhz*km
	@1300 nm	-	500 Mhz*km	500 Mhz*km	500 Mhz*km	500 Mhz*km
Serial Ethernet	@850 nm	-	-	-	1000 meters	1040 meters
1 Gigabit	@1300 nm	-	-	-	600 meters	600 meters
Serial Ethernet	@850 nm	-	-	-	300 meters	550 meters
10 Gigabit	@1300 nm	-	-	-	300 meters	300 meters

Mechanical and Environmental Properties

Test	Test Conditions	Value		Unit	Method
Fiber Count	-	4-12F	24F	-	-
Tube Diameter	-	3.0 ±3%	3.0 ±3%	mm	IEC 60811-203
Approx. Cable Diameter	-	7.9 ±0.2	7.9 ±0.2	mm	IEC 60811-203
Approx. Cable Weight	-	82.5 ±10%	82.5 ±10%	kg/km	
Max. Tensile Strength	During Installation (Loaded)	650		N	IEC 60794-1-2 E1
	In Service (Unloaded)	350			
Min. Bending Radius	During Installation (Loaded)	20xD		mm	IEC 60794-1-2 E11
	In Service (Unloaded)	15xD			
Crush Resistance	ShortTerm	3000		N/dm	IEC 60794-1-2 E3
	LongTerm	1600			
Impact Resistance	Wp=1.5J	3		Impact	IEC 60794-1-2 E4
Repeated Bending	r=20xD	35		cycles	IEC 60794-1-2 E6
Water Penetration	h=1m, 48h, p < 3m	passed		-	IEC 60794-1-22 F5B
Temperature Range	During installation	-30 to +60		°C	IEC 60794-1-22 F1
	In service	-20 to +70			
	In storage	0 to +70			

Combustion Properties

Fiber Type	Test Conditions	Type	Value	Unit	Result	Method
Fire Load	-	All types	1.5	Mj/m	-	-
Fire Propagation	On a vertical single cable	All types	-	-	passed	IEC 60332-1-2
Smoke Density	-	All types	-	-	passed	IEC 61034-2
Halogen Acid Gas	Jacket material	All types	-	-	passed	IEC 60754-1
Degree of Acidity	Jacket material	All types	-	-	passed	IEC 60754-2

Cable Coding System

O - 24 - DI - 79 - SDC - DD - H - BK							
Type	Fiber Count	Cable Type	Diameter	Tube Type	Fiber Type	Sheath Mat.	Color
Outdoor: O	4 Fiber: 04 6 Fiber: 06 8 Fiber: 08 12 Fiber: 12 24 Fiber: 24	Distribution: DI	7.9 mm: 79	Steel Armoured Dry Central Loose Tube: SDC	SM G.652 D: DD SM G.657 A2: A2 SM G.657 B3: B3 MM G.651 OM1: M1 MM G.651 OM2: M2 MM G.651 OM3: M3 MM G.651 OM4: M4	LSZH: H	Black: BK DD Black: BK A2 Black: BK B3 Black: BK M1 Black: BK M2 Black: BK M3 Black: BK M4