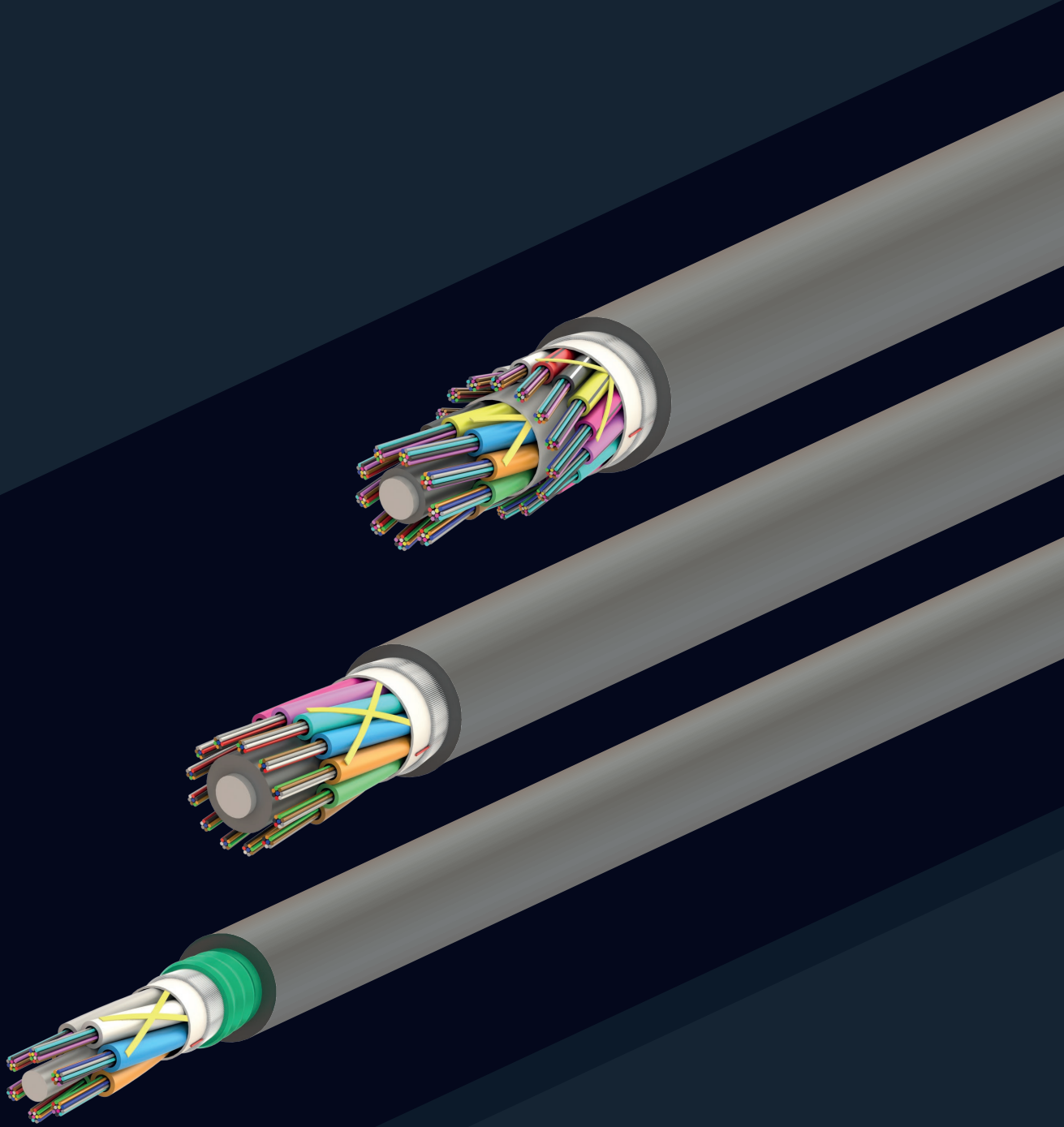




# FIBER OPTIC CABLES



# OUTDOOR



Founded in 2003, SAMP Technology offers cutting-edge products and services in the fields of telecommunication infrastructure and data center by producing in line with the expectations and needs of its customers.

With more than 20 years of experience, SAMP Technology has become one of the important suppliers of Europe in terms of capacity, technology and innovation by continuously investing in production, technology, R&D and people.

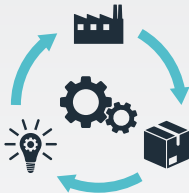
SAMP Teknoloji produces high performance fiber optic cables, fiber optic cable assemblies, data center infrastructure products and structured cabling solutions in its two factories located in the Gosb/Gebze industrial zone.

SAMP also has a ministry-approved research and development center since 2017.



### **20+ Years' Experience**

With more than 200 employees and 2 factories, we have achieved several significant projects in telecommunication fiber optic infrastructure.



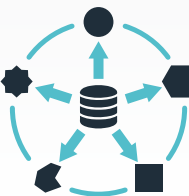
### **World Class Production**

With systematic and scientific methods, we always focus on reaching the highest quality in our fiber optic cable production and assembly lines.



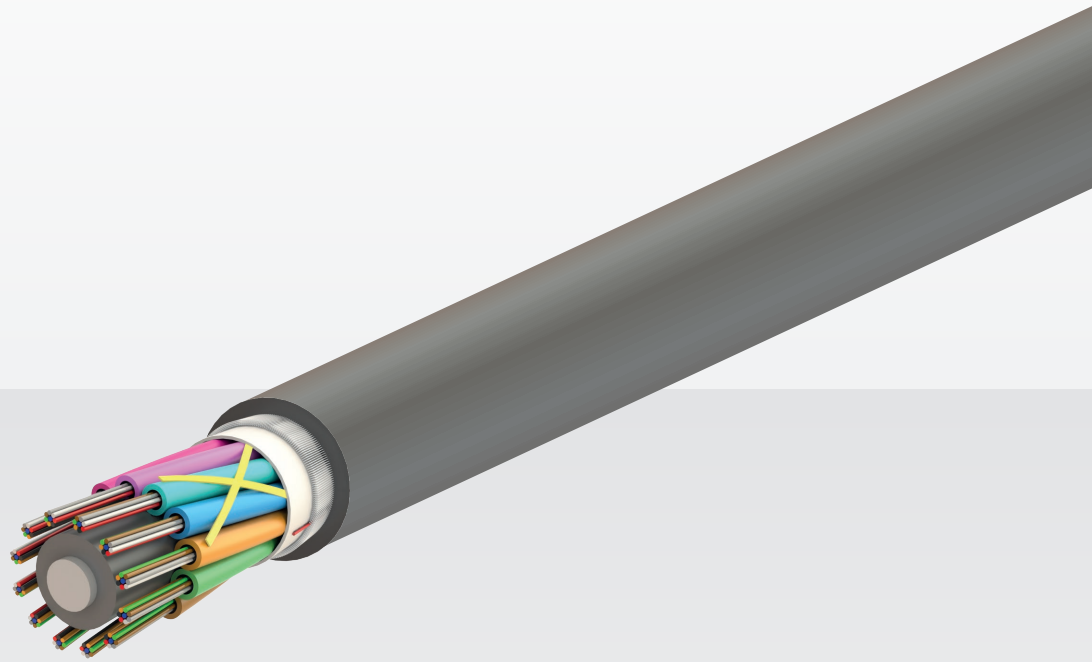
### **Connecting Continents**

An advantageous shipping location, at the intersection of Asia, Europe and the Middle-East.



### **Innovative Solutions**

We are passionate about responding to customer demand and keeping pace with the ever-evolving telecommunication and fiber optic technologies.



# OUTDOOR FIBER OPTIC CABLES

## Single-mode Fiber Specifications

### Optical Characteristics of Single-mode Fiber

	Conditions	Unit	E9/125			
			G.652.D	G.657.A1	G.657.A2	G.657.B3
Attenuation typical (in cable)	1310 nm	dB/km	≤ 0.34	≤ 0.35	≤ 0.35	≤ 0.35
	1383 nm	dB/km	≤ 0.34	≤ 0.35	≤ 0.35	≤ 0.35
	1550 nm	dB/km	≤ 0.20	≤ 0.21	≤ 0.21	≤ 0.21
	1625 nm	dB/km	≤ 0.24	≤ 0.23	≤ 0.23	≤ 0.23
Attenuation maximum (in cable)	1310 nm	dB/km	≤ 0.40	≤ 0.40	≤ 0.40	≤ 0.40
	1383 nm	dB/km	≤ 0.40	≤ 0.40	≤ 0.40	≤ 0.40
	1550 nm	dB/km	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
	1625 nm	dB/km	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
Cable cut-off wavelength $\lambda_{cc}$	standard	nm	≤ 1260	≤ 1260	≤ 1260	≤ 1260
Chromatic dispersion	1285 - 1330 nm	ps/nm × km	≤ 3.50	≤ 3.50	≤ 3.50	≤ 3.50
	1550 nm	ps/nm × km	≤ 18	≤ 18	≤ 18	≤ 18
Zero dispersion wavelength $\lambda_0$	-	-	1300 - 1324	1300 - 1324	1300 - 1324	1300 - 1324
Zero dispersion slope S0 at $\lambda_0$	-	-	≤ 0.092	≤ 0.092	≤ 0.092	≤ 0.092
Polarisation mode dispersion	link value	ps/√km	≤ 0.06	≤ 0.06	≤ 0.06	≤ 0.06
	individual	ps/√km	≤ 0.10	≤ 0.10	≤ 0.10	≤ 0.10
Mode-field diameter	1310 nm	μm	8.7 - 9.5	8.4 - 9.2	8.4 - 9.2	8.2 - 9.0
	1550 nm	μm	9.8 - 10.8	9.3 - 10.3	9.3 - 10.3	9.1 - 10.1
Macrobending loss r = 5.0 mm, 1 turn	1550 nm	dB	-	-	-	≤ 0.15
	1625 nm	dB	-	-	-	≤ 0.45
Macrobending loss r = 7.5 mm, 1 turn	1550 nm	dB	-	-	≤ 0.50	≤ 0.08
	1625 nm	dB	-	-	≤ 1.0	≤ 0.25
Macrobending loss r = 10 mm, 1 turn	1550 nm	dB	-	≤ 0.75	≤ 0.1	≤ 0.03
	1625 nm	dB	-	≤ 1.50	≤ 0.2	≤ 0.1
Macrobending loss r = 15 mm, 10 turn	1550 nm	dB	-	≤ 0.25	≤ 0.03	≤ 0.02
	1625 nm	dB	-	≤ 1.00	≤ 0.1	≤ 0.05
Macrobending loss r = 16/30 mm, 1/100 turn	1550 nm	dB	≤ 0.05	-	-	-
	1625 nm	dB	≤ 0.05	-	-	-

### Geometrical Characteristics

	Unit	E9/125			
		G.652.D	G.657.A1	G.657.A2	G.657.B3
Cladding diameter	μm	125 ± 0.7		125 ± 0.7	
Coating diameter (uncoloured)	μm	235-250		235-245	
Concentricity error core/cladding	μm	≤ 0.6		≤ 0.5	
Concentricity error cladding/coating	μm	≤ 12.0		≤ 12.0	
Cladding non-circularity	%	≤ 1.0		≤ 0.7	
Coating non-circularity	%	≤ 6.0		≤ 6.0	

## Mechanical and Environmental characteristics

	Unit	E9/125			
		G.652.D	G.657.A1	G.657.A2	G.657.B3
Tensile proof test (fiber elongation $\leq 1\%$ )	N (kpsi)	$\geq 9.0$ (100)			
Operation temperature range $-60$ to $85\text{ }^{\circ}\text{C}$ (1310, 1550 and 1625 nm)	$\Delta$ dB/km	$\leq 0.05$			
Water immersion $23\text{ }^{\circ}\text{C}$ for 30 days (1310, 1550 and 1625 nm)	$\Delta$ dB/km	$\leq 0.05$			

## Specifications

	E9/125			
	G.652.D	G.657.A1	G.657.A2	G.657.B3
Standards	ITU-T G.652.D	ITU-T G.657.A1	ITU-T G.657.A2	ITU-T G.657.B3
	IEC 60793-2-50 B-652.D	IEC 60793-2-50 B-657.A1	IEC 60793-2-50 B-657.A2	IEC 60793-2-50 B-657.B3

## Multi-mode Fiber Specifications

### Optical Characteristics of Multi-mode Fiber

	Conditions	Unit	G62.5/125	G50/125				
			OM1	OM2	OM2+	OM3	OM4	OM5
Effective Modal Bandwidth	850 nm	MHz × km	N/A	N/A	950	2000	4700	4700
Overfilled Modal Bandwidth	850 nm	MHz × km	200	500	700	1500	3500	3500
	1300 nm	MHz × km	500	500	500	500	500	500
1000BASE-SR	850 nm	m	275	500	750	1000	1100	N/S
10GBASE-SR	850 nm	m	N/S	83	150	300	550	N/S
40GBASE-SR4 / 100GBASE-SR10	850 nm	m	N/A	N/A	N/A	140	170	200
Bending loss at 850/1300 nm	r= 37.5 mm	dB	0.5/0.5	0.1/0.2				
	r= 15.0 mm	dB	-	0.1/0.3				
	r= 7.5 mm	dB	-	0.2/0.5				
Attenuation typical (in cable)	850 nm	dB/km	2.6	2.3				
	1300 nm	dB/km	0.5	0.5				
Attenuation maximum (in cable)	850 nm	dB/km	≤ 3	≤ 2.7				
	1300 nm	dB/km	≤ 1.0	≤ 1.0				
Numerical aperture	-	-	0.275±0.015	0.200 ± 0.015				

### Geometrical Characteristics

	Unit	G62.5/125	G50/125				
		OM1	OM2	OM2+	OM3	OM4	OM5
Core diameter	µm	62.5 ± 2.5	50 ± 2.5				
Cladding diameter	µm	125 ± 1	125 ± 1				
Coating diameter	µm	245 ± 7	242 ± 7				
Concentricity error core/cladding	µm	≤ 1.5	≤ 1.0				
Core non-circularity	µm	≤ 5.0	≤ 5.0				
Cladding non-circularity	%	≤ 1.0	≤ 1.0				
Coating non-circularity	%	≤ 6.0	≤ 6.0				

### Mechanical and Environmental Characteristics

	Unit	G62.5/125	G50/125				
		OM1	OM2	OM2+	OM3	OM4	OM5
Coating strip force (Typical/Peak)	N	1.0 to 3.0 / 1.3 to 8.9					
Tensile proof test at fiber elongation ≤ 1 %	N (kpsi)	≥ 9.0 (100)					
Temperature range max. Δ 0.1 dB/km 850/1300 nm	°C	-60 to +85					
Water immersion max. Δ 0.2 dB/km 850/1300 nm	-	23 °C more than 30 days					

### Specifications

Standards	G62.5/125	G50/125				
	OM1	OM2	OM2+	OM3	OM4	OM5
	IEC 60793-2-10	IEC 60793-2-10 (ITU-T G.651.1)				
	A1-OM1	A1-OM2b	A1-OM2b	A1-OM3b	A1-OM4b	A1-OM5b

## Fiber Optic Color Coding

### Fiber Color Coding

ANSI/TIA-598 (Samm Standard)

Number	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Gray	White	Red	Black	Yellow	Violet	Pink	Aqua

DIN VDE V 0888-100-1-1

Number	1	2	3	4	5	6	7	8	9	10	11	12
Color	Red	Green	Blue	Yellow	White	Gray	Brown	Violet	Aqua	Black	Orange	Pink

IEC 60794-2

Number	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Yellow	Red	White	Green	Violet	Orange	Gray	Aqua	Black	Brown	Pink

Note: If the color sequence is repeated for fibers 13-24, the fibers are marked with black stripes or dashes.

### Tube Color Coding

ANSI/TIA-598 (Samm Standard)

Number	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Gray	White	Red	Black	Yellow	Violet	Pink	Aqua

Notes:

- If the color sequence is repeated for fibers 13-24, the fibers are marked with black stripes or dashes.
- If loose tubes are divided into layers, the tube colors restart from 1 for each layer.

### Color Abbreviation According to IEC-60757

Abb.	BU	OG	GN	BN	GY	WH	RD	BK	YE	VT	PK	AQ
Color	Blue	Orange	Green	Brown	Gray	White	Red	Black	Yellow	Violet	Pink	Aqua

### Standard Jacket Colors

Abb.	OG	GY	WH	BK	YE	VT	AQ	LG
Color	Orange	Gray	White	Black	Yellow	Violet	Aqua	Lime Green

## Fiber Optic Cable Design Coding Guide

Design Number = **A<sub>1</sub>** **B<sub>1</sub>** **C<sub>1</sub>** **D<sub>1</sub>** **E<sub>1</sub>**

Design Number Example: 30121901

Design Code = **A<sub>2</sub>** - **B<sub>2</sub>** **C<sub>2</sub>** **D<sub>2</sub>** - **E<sub>2</sub>**

Design Code Example: A-D1Q(ZN-GY)(SR)2Y-1D250

A <sub>1</sub>	A <sub>2</sub>	Description
1	I	Indoor
2	U	Indoor&Outdoor
3	A	Outdoor
4	IT	Indoor Breakout / Multi Tube
5	UT	Indoor&Outdoor Breakout / Multi Tube
6	AT	Outdoor Breakout / Multi Tube

B <sub>2</sub>	B <sub>1</sub>	Description
01	D1	Gel-Filled Loose Tube-PBT
02	D2	Gel-Filled Loose Tube-PC+PBT
03	D3	Gel-Filled Loose Tube-PA
04	D4	Gel-Filled Loose Tube-LSZH
05	D5	Gel-Filled Loose Tube-PBT-FR
06	B1	Gel-Free Loose Tube-LSZH
07	B2	Gel-Free Loose Tube-PP
08	B3	Gel-Free Loose Tube-LSZH (w/Aramid)
09	B4	Gel-Free Flex Tube-LSZH
10	VS9	Semi-Tight Buffer 900 mic LSZH
11	VT6	Tight Buffer 600 mic LSZH
12	VT9	Tight Buffer 900 mic LSZH
13	WS9	Semi-Tight Buffer 900 mic TPE-E
14	WT6	Tight Buffer 600 mic TPE-E
15	WT9	Tight Buffer 900 mic TPE-E
16	PS9	Semi-Tight Buffer 900 mic PA
17	PT6	Tight Buffer 600 mic PA
18	PT9	Tight Buffer 900 mic PA
19	VE9	Easy Strip Buffer 900 mic LSZH

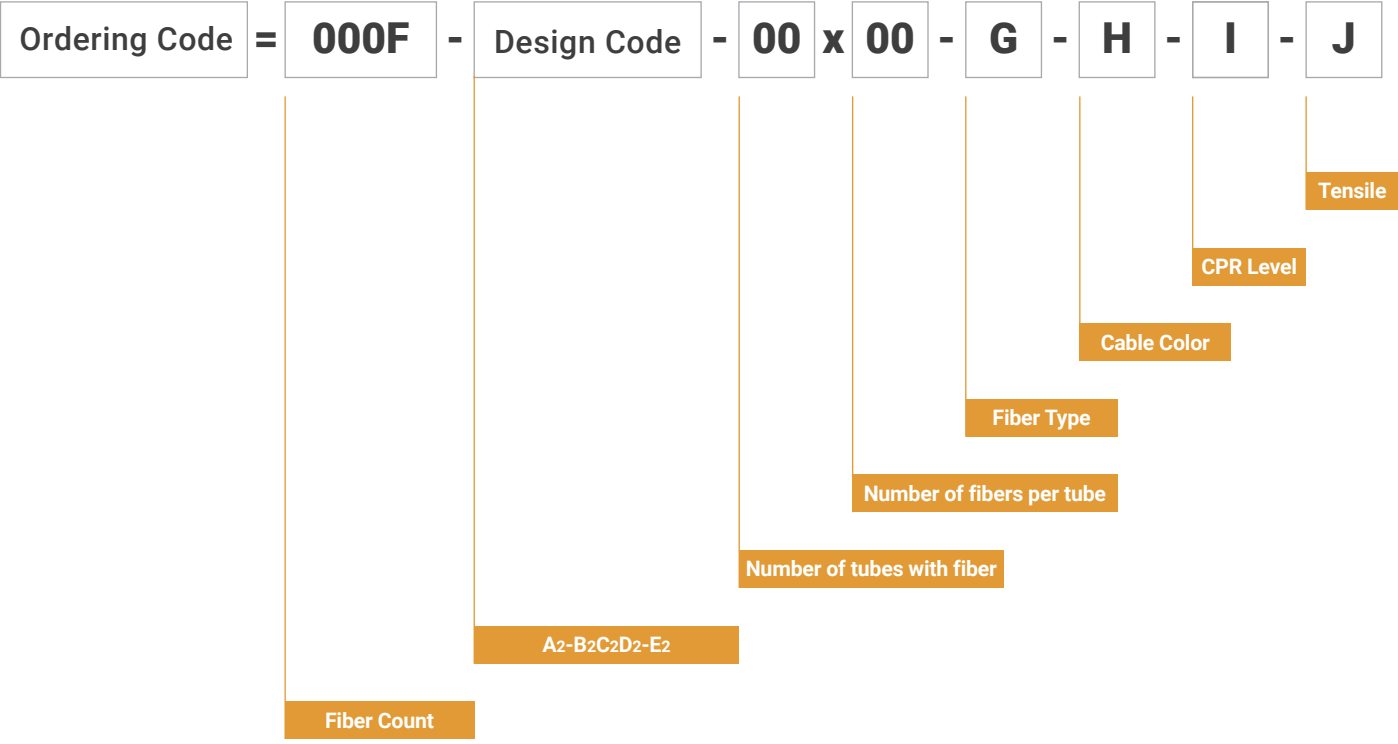
C <sub>1</sub>	C <sub>2</sub>	Description
0		Non-Loose-Tube
1	F	Gel-Filled Core
2	Q	Dry Core

E <sub>1</sub>	E <sub>2</sub>	Description
00		Non-Loose-Tube
01	1D250	1 Gel-filled Loose Tube 2.5 mm
02	1D300	1 Gel-filled Loose Tube 3.0 mm
03	6D200	6 Gel-filled Loose Tube 2.0 mm
04	8D200	8 Gel-filled Loose Tube 2.0 mm
05	12D200	12 Gel-filled Loose Tube 2.0 mm
06	18D200	18 Gel-filled Loose Tube 2.0 mm
07	18D280	18 Gel-filled Loose Tube 2.8 mm
08	24D200	24 Gel-filled Loose Tube 2.0 mm
09	6D170	6 Gel-filled Loose Tube 1.7 mm
10	8D170	8 Gel-filled Loose Tube 1.7 mm
11	12D170	12 Gel-filled Loose Tube 1.7 mm
12	24D170	24 Gel-filled Loose Tube 1.7 mm
13	6D140	6 Gel-filled Loose Tube 1.4 mm
14	8D140	8 Gel-filled Loose Tube 1.4 mm
15	12D140	12 Gel-filled Loose Tube 1.4 mm
16	24D140	24 Gel-filled Loose Tube 1.4 mm
17	24D190	24 Gel-filled Loose Tube 1.9 mm
18	1B250	1 Gel-free Loose Tube 2.5 mm
19	1B300	1 Gel-free Loose Tube 3.0 mm
20	4B200	4 Gel-free Loose Tube 2.0 mm
21	6B200	6 Gel-free Loose Tube 2.0 mm
22	6B250	6 Gel-free Loose Tube 2.5 mm

D <sub>1</sub>	D <sub>2</sub>	Description
01	Y	PVC sheath
02	H	LSZH sheath
03	2Y	PE sheath
04	4Y	PA sheath
05	11Y	PUR sheath
06	(L)2Y	Aluminium multi-layer under PE sheath
07	(SR)2Y	Corrugated steel tape reinforcement under PE sheath
08	(SR)H	Corrugated steel tape reinforcement under LSZH sheath
09	(ZN-AY)2Y	Aramid yarn under PE sheath
10	(ZN-GY)2Y	Glass yarn under PE sheath
11	(ZN-AY)H	Aramid yarn under LSZH sheath
12	(ZN-GY)H	Glass yarn under LSZH sheath
13	(ZM)H	Metallic strain relief element under LSZH sheath
14	(ZN-AY)B2Y	Aramid yarn and rodent protection under PE sheath
15	(ZN-GY)B2Y	Glass yarn and rodent protection under PE sheath
16	(ZN-AY)BH	Aramid yarn and rodent protection under LSZH sheath
17	(ZN-GY)BH	Glass yarn and rodent protection under LSZH sheath
18	(ZN-AY)(SR)2Y	Aramid yarn and corrugated steel tape under PE sheath
19	(ZN-GY)(SR)2Y	Glass yarn and corrugated steel tape under PE sheath
20	(ZN-AY)(SR)H	Aramid yarn and corrugated steel tape under LSZH sheath
21	(ZN-GY)(SR)H	Glass yarn and corrugated steel tape under LSZH sheath
22	-SH	Steel wire for aerial application
23	(ZN-2S)H	Steel strength member under LSZH sheath
24	(ZN-2S)HT	Steel strength member+steel messenger under LSZH sheath
25	(ZN-2P)H	FRP strength member under LSZH sheath
26	(ZN-2P)HT	FRP strength member+steel messenger under LSZH sheath
27	(ZN-AY)HH	Aramid yarn under double LSZH sheath
28	(ZN-GY)HH	Glass yarn under double LSZH sheath
29	(ZN-AY)H(ZN-AY)H	Aramid yarn under LSZH sheath, under, aramid yarn under LSZH sheath
30	(ZN-AY)H(ZN-GY)H	Aramid yarn under LSZH sheath, under, glass yarn under LSZH sheath
31	(ZN-GY)H(ZN-GY)H	Glass yarn under LSZH sheath, under, glass yarn under LSZH sheath
32	(ZN-GY)2Y(SR)2Y	Glass yarn under PE sheath, under, corrugated steel tape under PE sheath
33	(ZN-GY)2YT	Glass yarn under PE sheath with Steel Messenger
34	(ZN-GY)(SR)2YT	Glass yarn and corrugated steel tape under PE sheath with Steel Messenger
35	2Y(ZN-AY)2Y	PE sheath, under, aramid yarn under PE sheath
36	(ZN-AY)H(ZN-GY)BH	Aramid yarn under LSZH sheath, under, glass yarn and rodent protection under LSZH sheath
37	(ZN-AY)H(ZN-GY)H (ZN-GY)BH	Aramid yarn under LSZH sheath, under, glass yarn under LSZH sheath, under, glass yarn and rodent protection under LSZH sheath
38	(ZN-AY)11Y	Aramid yarn under PUR sheath



## Fiber Optic Cable Order Coding Guide



G	Fiber Type
2D	Single Mode G652.D
A1	Single Mode G657.A1
A2	Single Mode G657.A2
B3	Single Mode G657.B3
M1	Multi Mode G651.OM1
M2	Multi Mode G651.OM2
M3	Multi Mode G651.OM3
M4	Multi Mode G651.OM4
M5	Multi Mode G651.OM5

H	Cable Color
BK	Black
YE	Yellow
OG	Orange
AQ	Aqua
VT	Violet
WH	White
IV	Ivory
BU	Blue

I	CPR Level
	B2ca
	Cca
	Dca
	Eca
	Fca

J	Tensile
	kN

**Ordering Code Example:** 012F-A-D1Q(ZN-GY)(SR)2Y-1D250-1x12-2D-BK-Fca-1.2kN

## CLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE

Design Type **A-D1Q(ZN-GY)B2Y-1D250**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1

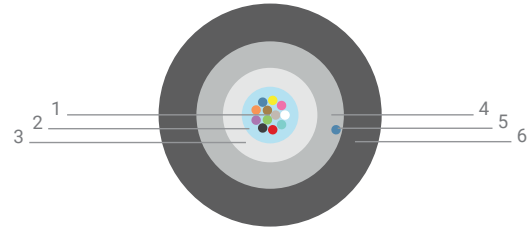
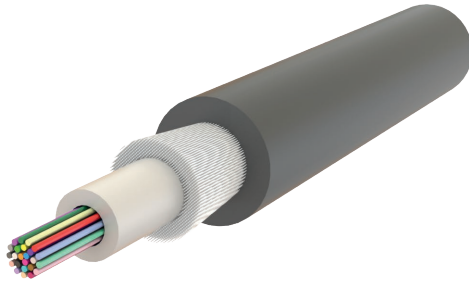


Fig.01 Scale 5:1

### Cable Construction

1	Fiber	SM/MM (250 μ)
2	Tube Filling Compound	Thixotropic Gel
3	Loose Tube	PBT
4	Strength Member	Swellable Glass Yarn
5	Ripcord	Polyester
6	Outer Jacket	UV Resistant PE

### Properties

Metal free indoor and outdoor cable with Gel-filled tube
Glass yarn strength member
PE outer jacket for use in ducts and unprotected environments
Low fire load for high safety requirements
Longitudinal and transversal water resistant cable
Has a ripcord for easy stripping

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	1200 N
	In Service		600 N
Crush Resistance	Installation	IEC 60794-1-21-E3	1500 N
	In Service		750 N
Impact	-	IEC 60794-1-21-E4	Wp=1.5J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-0 to +50 °C
	In Service		-20 to +60 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
004F-A-D1Q(ZN-GY)B2Y-1D250-1x4-...-BK-Fca-1.2kN	4	1	2.5	5.9	31
008F-A-D1Q(ZN-GY)B2Y-1D250-1x8-...-BK-Fca-1.2kN	8	1	2.5	5.9	31
012F-A-D1Q(ZN-GY)B2Y-1D250-1x12-...-BK-Fca-1.2kN	12	1	2.5	5.9	31
024F-A-D1Q(ZN-GY)B2Y-1D300-1x24-...-BK-Fca-1.2kN	24	1	3.0	6.3	35

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 012F-A-D1Q(ZN-GY)B2Y-1D250-1x12-2D-BK-Fca-1.2kN

## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	800 mm	900 mm
Drum core diameter	500 mm	500 mm
Outside width	600 mm	650 mm

## CLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **A-D1Q(ZN-GY)(SR)2Y-1D250**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1

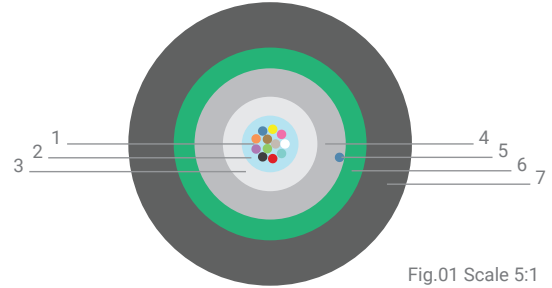
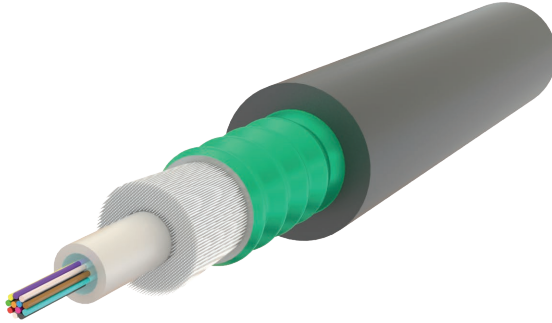
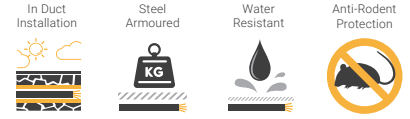


Fig.01 Scale 5:1

### Cable Construction

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

### Properties

Corrugated Steel Armoured Outdoor Cable
Glass yarn strength member
Gel-filled tube
PE outer jacket for use in ducts and unprotected environments
Low fire load for high safety requirements
Longitudinal and transversal water resistant cable
Has a ripcord for easy stripping

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	1200 N
	In Service		600 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=1.5J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-30 to +60 °C
	In Service		-20 to +70 °C
	Storage		0 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
004F-A-D1Q(ZN-GY)(SR)2Y-1D250-1x4-...-BK-Fca-1.2kN	4	1	2.5	7.5	60
008F-A-D1Q(ZN-GY)(SR)2Y-1D250-1x8-...-BK-Fca-1.2kN	8	1	2.5	7.5	60
012F-A-D1Q(ZN-GY)(SR)2Y-1D250-1x12-...-BK-Fca-1.2kN	12	1	2.5	7.5	60
024F-A-D1Q(ZN-GY)(SR)2Y-1D300-1x24-...-BK-Fca-1.2kN	24	1	3.0	7.9	66

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 024F-A-D1Q(ZN-GY)(SR)2Y-1D300-1x24-2D-BK-Fca-1.2kN

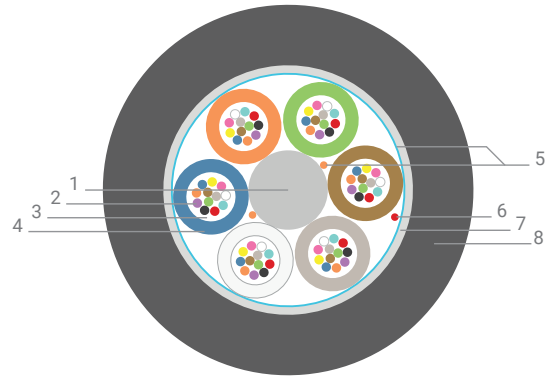
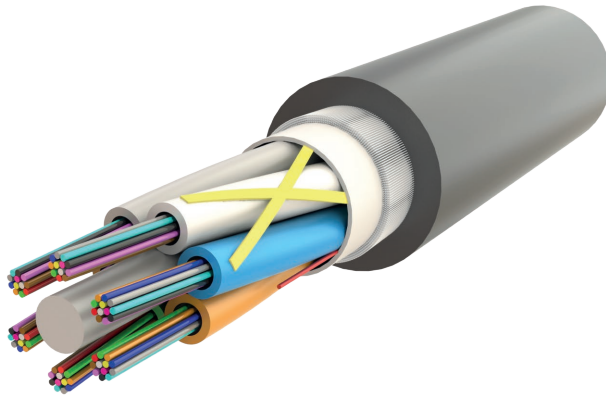
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	800 mm	1000 mm
Drum core diameter	500 mm	500 mm
Outside width	600 mm	650 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)B2Y-6D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Outer Jacket	UV Resistant PE

### Properties

- Metal free indoor and outdoor cable with Gel-filled tube
- Glass yarn strength member
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 72 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
002F-AT-D1Q(ZN-GY)B2Y-6D200-1x2-...-BK-Fca-2.7kN	2	1	5	2.0	9.8	70
004F-AT-D1Q(ZN-GY)B2Y-6D200-1x4-...-BK-Fca-2.7kN	4	1	5	2.0	9.8	70
004F-AT-D1Q(ZN-GY)B2Y-6D200-2x2-...-BK-Fca-2.7kN	4	2	4	2.0	9.8	71
008F-AT-D1Q(ZN-GY)B2Y-6D200-1x8-...-BK-Fca-2.7kN	8	1	5	2.0	9.8	70
008F-AT-D1Q(ZN-GY)B2Y-6D200-2x4-...-BK-Fca-2.7kN	8	2	4	2.0	9.8	71
008F-AT-D1Q(ZN-GY)B2Y-6D200-4x2-...-BK-Fca-2.7kN	8	4	2	2.0	9.8	73
012F-AT-D1Q(ZN-GY)B2Y-6D200-1x12-...-BK-Fca-2.7kN	12	1	5	2.0	9.8	70
012F-AT-D1Q(ZN-GY)B2Y-6D200-6x2-...-BK-Fca-2.7kN	12	6	0	2.0	9.8	76
016F-AT-D1Q(ZN-GY)B2Y-6D200-2x8-...-BK-Fca-2.7kN	16	2	4	2.0	9.8	71
016F-AT-D1Q(ZN-GY)B2Y-6D200-4x4-...-BK-Fca-2.7kN	16	4	2	2.0	9.8	73
024F-AT-D1Q(ZN-GY)B2Y-6D200-2x12-...-BK-Fca-2.7kN	24	2	4	2.0	9.8	71
024F-AT-D1Q(ZN-GY)B2Y-6D200-6x4-...-BK-Fca-2.7kN	24	6	0	2.0	9.8	76
048F-AT-D1Q(ZN-GY)B2Y-6D200-4x12-...-BK-Fca-2.7kN	48	4	2	2.0	9.8	73
048F-AT-D1Q(ZN-GY)B2Y-6D200-6x8-...-BK-Fca-2.7kN	48	6	0	2.0	9.8	76
072F-AT-D1Q(ZN-GY)B2Y-6D200-6x12-...-BK-Fca-2.7kN	72	6	0	2.0	9.8	76

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 072F-AT-D1Q(ZN-GY)B2Y-6D200-6x12-2D-BK-Fca-2.7kN

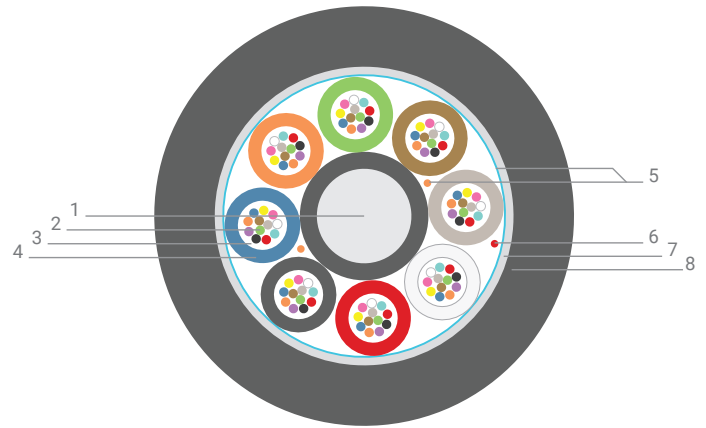
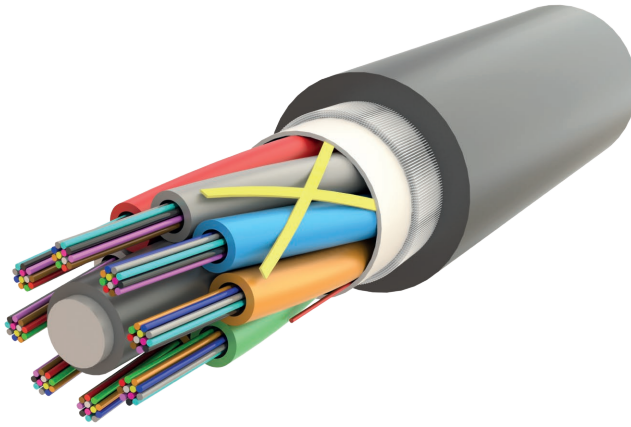
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1000 mm	1000 mm
Drum core diameter	500 mm	500 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)B2Y-8D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Outer Jacket	UV Resistant PE

### Properties

- Metal free indoor and outdoor cable with Gel-filled tube
- Glass yarn strength member
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 96 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles



## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)B2Y-8D200-8x12-...-BK-Fca-2.7kN	96	8	0	2.0	11.1	96

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 096F-AT-D1Q(ZN-GY)B2Y-8D200-8x12-2D-BK-Fca-2.7kN

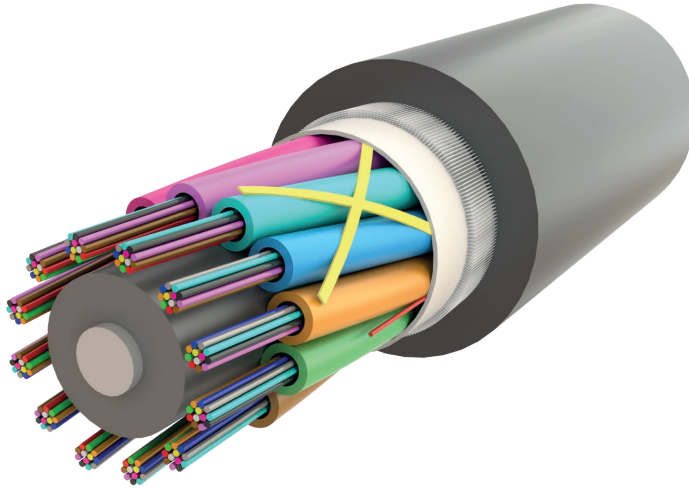
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1000 mm	1200 mm
Drum core diameter	500 mm	500 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)B2Y-12D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Outer Jacket	UV Resistant PE

### Properties

- Metal free indoor and outdoor cable with Gel-filled tube
- Glass yarn strength member
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 144 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1300 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)B2Y-12D200-12x8-...-BK-Fca-2.7kN	96	12	0	2.0	13.5	140
144F-AT-D1Q(ZN-GY)B2Y-12D200-12x12-...-BK-Fca-2.7kN	144	12	0	2.0	13.5	140

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 144F-AT-D1Q(ZN-GY)B2Y-12D200-12x12-2D-BK-Fca-2.7kN

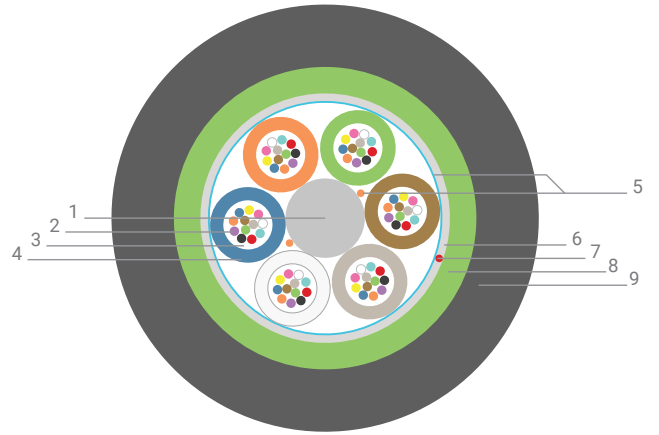
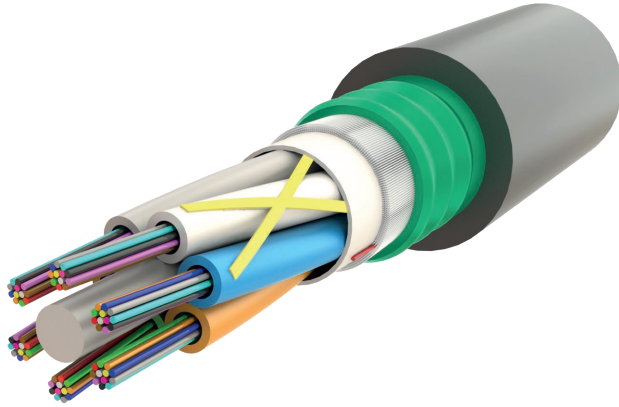
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1200 mm	1400 mm
Drum core diameter	500 mm	500 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-6D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable  
Glass yarn strength member  
Gel-filled tube  
PE outer jacket for use in ducts and unprotected environments  
Low fire load for high safety requirements  
Longitudinal and transversal water resistant cable  
Has a ripcord for easy stripping  
Up to 72 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
002F-AT-D1Q(ZN-GY)(SR)2Y-6D200-1x2-...-BK-Fca-2.7kN	2	1	5	2.0	11.3	125
004F-AT-D1Q(ZN-GY)(SR)2Y-6D200-1x4-...-BK-Fca-2.7kN	4	1	5	2.0	11.3	125
004F-AT-D1Q(ZN-GY)(SR)2Y-6D200-2x2-...-BK-Fca-2.7kN	4	2	4	2.0	11.3	125
008F-AT-D1Q(ZN-GY)(SR)2Y-6D200-1x8-...-BK-Fca-2.7kN	8	1	5	2.0	11.3	125
008F-AT-D1Q(ZN-GY)(SR)2Y-6D200-2x4-...-BK-Fca-2.7kN	8	2	4	2.0	11.3	125
008F-AT-D1Q(ZN-GY)(SR)2Y-6D200-4x2-...-BK-Fca-2.7kN	8	4	2	2.0	11.3	125
012F-AT-D1Q(ZN-GY)(SR)2Y-6D200-1x12-...-BK-Fca-2.7kN	12	1	5	2.0	11.3	125
012F-AT-D1Q(ZN-GY)(SR)2Y-6D200-6x2-...-BK-Fca-2.7kN	12	6	0	2.0	11.3	125
016F-AT-D1Q(ZN-GY)(SR)2Y-6D200-2x8-...-BK-Fca-2.7kN	16	2	4	2.0	11.3	125
016F-AT-D1Q(ZN-GY)(SR)2Y-6D200-4x4-...-BK-Fca-2.7kN	16	4	2	2.0	11.3	125
024F-AT-D1Q(ZN-GY)(SR)2Y-6D200-2x12-...-BK-Fca-2.7kN	24	2	4	2.0	11.3	125
024F-AT-D1Q(ZN-GY)(SR)2Y-6D200-6x4-...-BK-Fca-2.7kN	24	6	0	2.0	11.3	125
048F-AT-D1Q(ZN-GY)(SR)2Y-6D200-4x12-...-BK-Fca-2.7kN	48	4	2	2.0	11.3	125
048F-AT-D1Q(ZN-GY)(SR)2Y-6D200-6x8-...-BK-Fca-2.7kN	48	6	0	2.0	11.3	125
072F-AT-D1Q(ZN-GY)(SR)2Y-6D200-6x12-...-BK-Fca-2.7kN	72	6	0	2.0	11.3	125

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 072F-AT-D1Q(ZN-GY)(SR)2Y-6D200-6x12-2D-BK-Fca-2.7kN

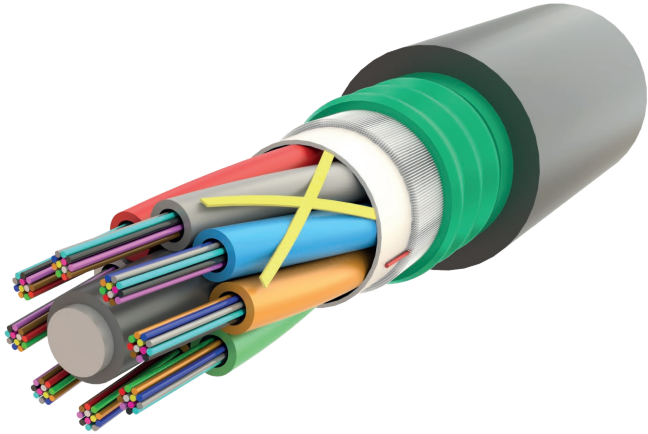
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1100 mm	1200 mm
Drum core diameter	500 mm	600 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-8D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable  
Glass yarn strength member  
Gel-filled tube  
PE outer jacket for use in ducts and unprotected environments  
Low fire load for high safety requirements  
Longitudinal and transversal water resistant cable  
Has a ripcord for easy stripping  
Up to 96 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)(SR)2Y-8D200-8x12-...-BK-Fca-2.7kN	96	8	0	2.0	12.5	150

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.0M2, G651.0M3, G651.0M4

\* Sample Code: 096F-AT-D1Q(ZN-GY)(SR)2Y-8D200-8x12-2D-BK-Fca-2.7kN

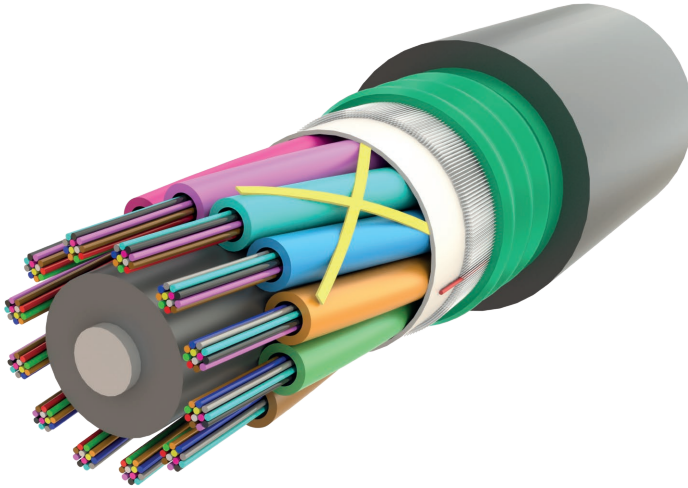
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1200 mm	1300 mm
Drum core diameter	500 mm	600 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-12D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

- Corrugated Steel Armoured Outdoor Cable
- Glass yarn strength member
- Gel-filled tube
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 144 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	4000 N
	In Service		2000 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles



## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)(SR)2Y-12D200-12x8-...-BK-Fca-4.0kN	96	12	0	2.0	15.0	207
144F-AT-D1Q(ZN-GY)(SR)2Y-12D200-12x12-...-BK-Fca-4.0kN	144	12	0	2.0	15.0	207

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 144F-AT-D1Q(ZN-GY)(SR)2Y-12D200-12x12-2D-BK-Fca-4.0kN

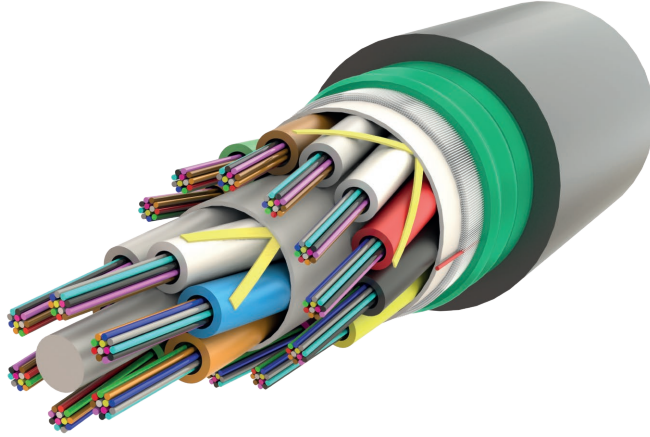
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1100 mm	1500 mm
Drum core diameter	500 mm	600 mm
Outside width	1000 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-18D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable
Glass yarn strength member
Gel-filled tube
PE outer jacket for use in ducts and unprotected environments
Low fire load for high safety requirements
Longitudinal and transversal water resistant cable
Has a ripcord for easy stripping
Up to 216 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	3500 N
	In Service		1750 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
216F-AT-D1Q(ZN-GY)(SR)2Y-18D200-18x12-...-BK-Fca-3.5kN	216	18	0	2.0	15.6	217

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 216F-AT-D1Q(ZN-GY)(SR)2Y-18D200-18x12-2D-BK-Fca-3.5kN

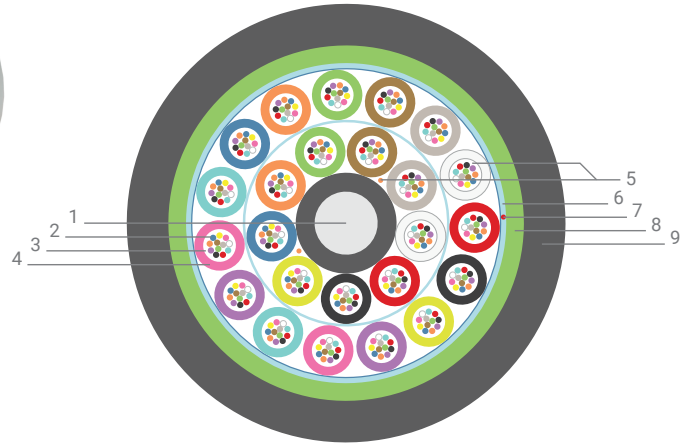
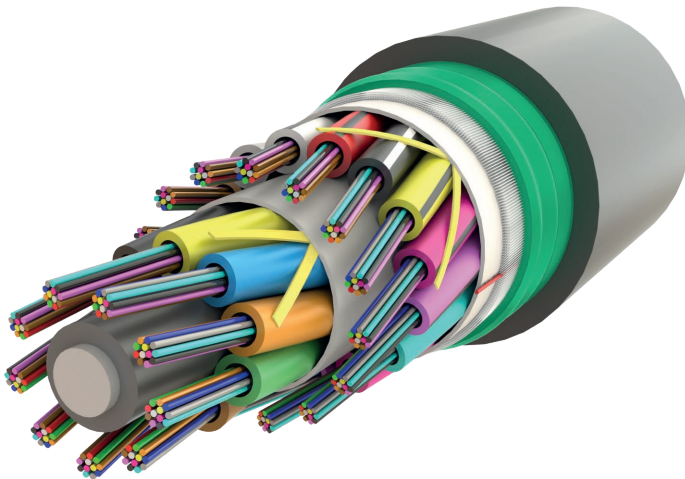
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1200 mm	1500 mm
Drum core diameter	600 mm	600 mm
Outside width	1000 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-24D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable  
Glass yarn strength member  
Gel-filled tube  
PE outer jacket for use in ducts and unprotected environments  
Low fire load for high safety requirements  
Longitudinal and transversal water resistant cable  
Has a ripcord for easy stripping  
Up to 288 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	4000 N
	In Service		2000 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
288F-AT-D1Q(ZN-GY)(SR)2Y-24D200-24x12-..-BK-Fca-4.0kN	288	24	0	2.0	17.4	267

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 288F-AT-D1Q(ZN-GY)(SR)2Y-24D200-24x12-2D-BK-Fca-4.0kN

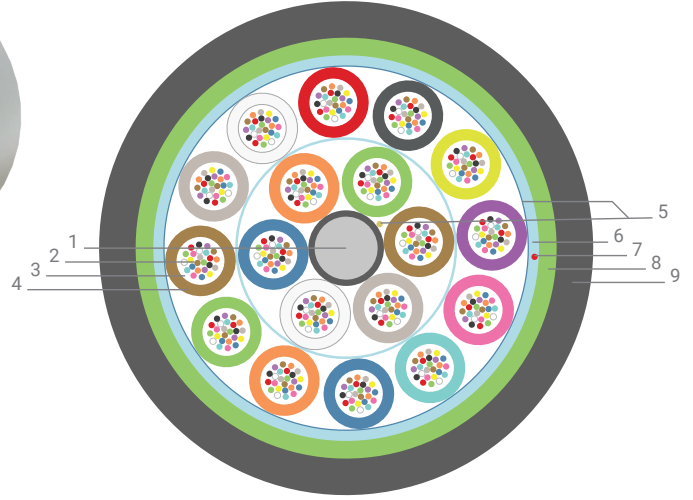
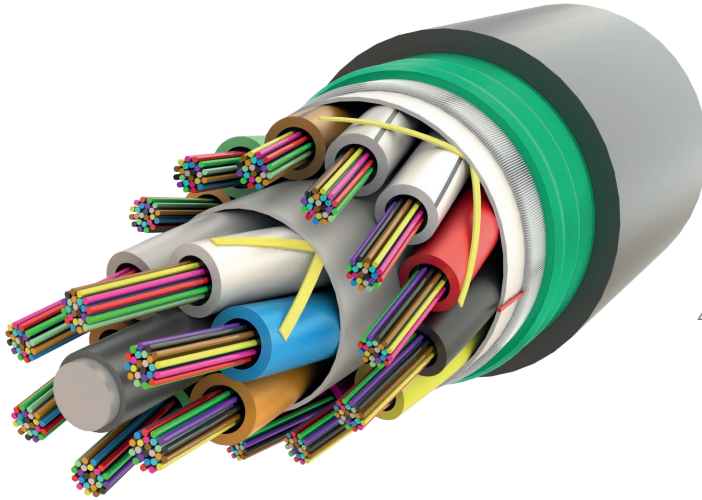
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1300 mm	1600 mm
Drum core diameter	600 mm	600 mm
Outside width	1000 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, SJ, PE

Design Type **AT-D1Q(ZN-GY)(SR)2Y-18D280**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Armoured Material	Corrugated Steel
9	Outer Jacket	UV Resistant PE

### Properties

- Corrugated Steel Armoured Outdoor Cable
- Glass yarn strength member
- Gel-filled tube
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 432 Fibers

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	5000 N
	In Service		2500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2200 N
	In Service		1100 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
432F-AT-D1Q(ZN-GY)(SR)2Y-18D280-18x24-..-BK-Fca-5.0kN	432	18	0	2.8	19.6	320

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 432F-AT-D1Q(ZN-GY)(SR)2Y-18D280-18x24-2D-BK-Fca-5.0kN

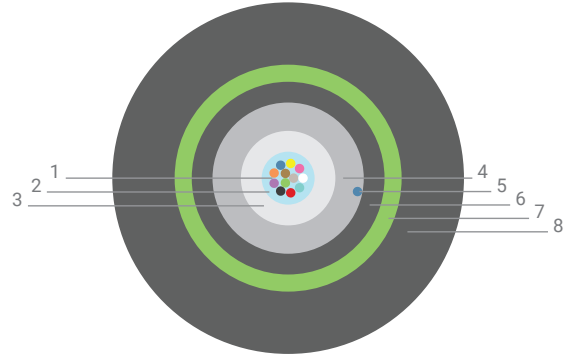
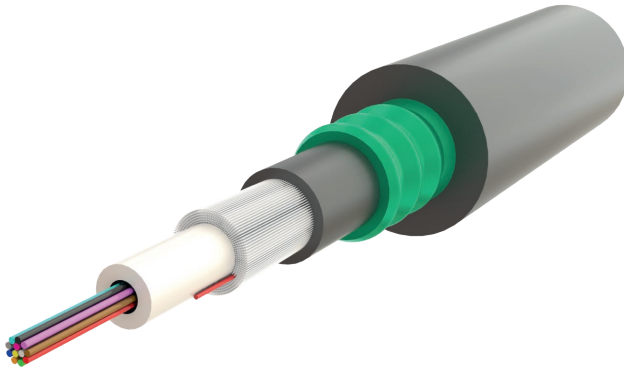
## Packaging

Drum length/Tolerance	2000 m ± 5%
Drum Flange diameter	1500 mm
Drum core diameter	600 mm
Outside width	1000 mm

## CLT, Gel-Filled, Dry Core, Steel Armoured, DJ, PE

Design Type **A-D1Q(ZN-GY)2Y(SR)2Y-1D250**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Fiber	Single-mode or Multi-mode
2	Tube Filling Material	Thixotropic Gel
3	Loose Tube	PBT
4	Strength Member	Swellable Glass Yarn
5	Ripcord	Polyester
6	Inner Jacket	UV Resistant PE
7	Armoured Material	Corrugated Steel
8	Outer Jacket	UV Resistant PE
9		
10		

### Properties

Corrugated Steel Armoured Outdoor Cable  
Glass yarn strength member  
Gel-filled tube  
PE outer jacket for use in ducts and unprotected environments  
Low fire load for high safety requirements  
Longitudinal and transversal water resistant cable  
Has a ripcord for easy stripping  
Up to 24Fibers  
Double Jacket for Direct Burial

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	1500 N
	In Service		750 N
Crush Resistance	Installation	IEC 60794-1-21-E3	4000 N
	In Service		2000 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles



## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-30 to +60 °C
	In Service		-20 to +70 °C
	Storage		0 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
004F-A-D1Q(ZN-GY)2Y(SR)2Y-1D250-1x4-...-BK-Fca-1.5kN	4	1	2.5	9.3	92
008F-A-D1Q(ZN-GY)2Y(SR)2Y-1D250-1x8-...-BK-Fca-1.5kN	8	1	2.5	9.3	92
012F-A-D1Q(ZN-GY)2Y(SR)2Y-1D250-1x12-...-BK-Fca-1.5kN	12	1	2.5	9.3	92
024F-A-D1Q(ZN-GY)2Y(SR)2Y-1D300-1x24-...-BK-Fca-1.5kN	24	1	3.0	9.8	100

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 024F-A-D1Q(ZN-GY)2Y(SR)2Y-1D300-1x24-2D-BK-Fca-1.5kN

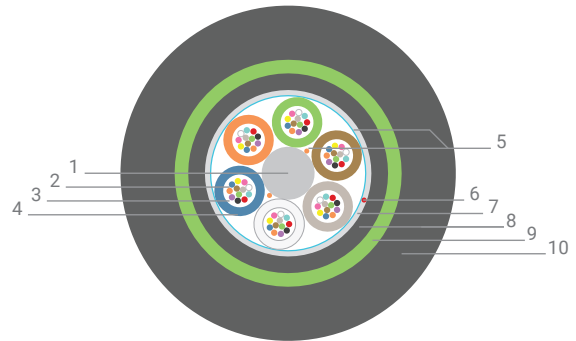
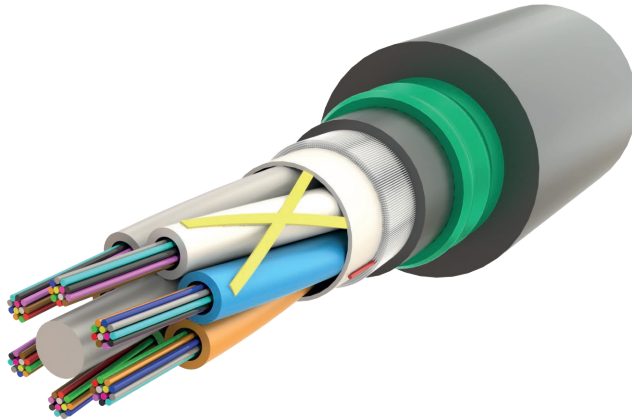
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1000 mm	1200 mm
Drum core diameter	500 mm	500 mm
Outside width	650 mm	650 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, DJ, PE

Design Type **AT-D1Q(ZN-GY)2Y(SR)2Y-6D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Inner Jacket	UV Resistant PE
9	Armoured Material	Corrugated Steel
10	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable
Glass yarn strength member
Gel-filled tube
PE outer jacket for use in ducts and unprotected environments
Low fire load for high safety requirements
Longitudinal and transversal water resistant cable
Has a ripcord for easy stripping
Up to 72 Fibers
Double Jacket for Direct Burial

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	4000 N
	In Service		2000 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
002F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-1x2-...-BK-Fca-2.7kN	2	1	5	2.0	13.3	161
004F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-1x4-...-BK-Fca-2.7kN	4	1	5	2.0	13.3	161
004F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-2x2-...-BK-Fca-2.7kN	4	2	4	2.0	13.3	161
008F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-1x8-...-BK-Fca-2.7kN	8	1	5	2.0	13.3	161
008F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-2x4-...-BK-Fca-2.7kN	8	2	4	2.0	13.3	161
008F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-4x2-...-BK-Fca-2.7kN	8	4	2	2.0	13.3	161
012F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-1x12-...-BK-Fca-2.7kN	12	1	5	2.0	13.3	161
012F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-6x2-...-BK-Fca-2.7kN	12	6	0	2.0	13.3	161
016F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-2x8-...-BK-Fca-2.7kN	16	2	4	2.0	13.3	161
016F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-4x4-...-BK-Fca-2.7kN	16	4	2	2.0	13.3	161
024F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-2x12-...-BK-Fca-2.7kN	24	2	4	2.0	13.3	161
024F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-6x4-...-BK-Fca-2.7kN	24	6	0	2.0	13.3	161
048F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-4x12-...-BK-Fca-2.7kN	48	4	2	2.0	13.3	161
048F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-6x8-...-BK-Fca-2.7kN	48	6	0	2.0	13.3	161
072F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-6x12-...-BK-Fca-2.7kN	72	6	0	2.0	13.3	161

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 072F-AT-D1Q(ZN-GY)2Y(SR)2Y-6D200-6x12-2D-BK-Fca-2.7kN

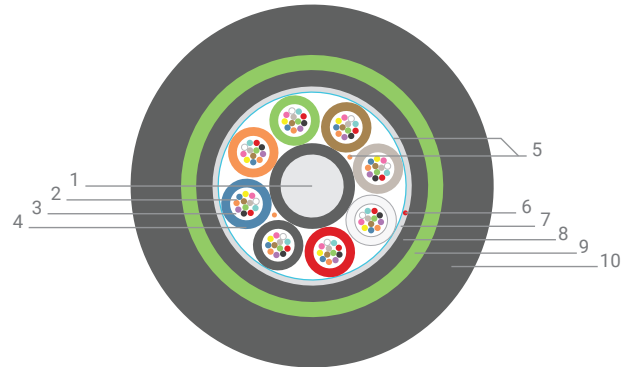
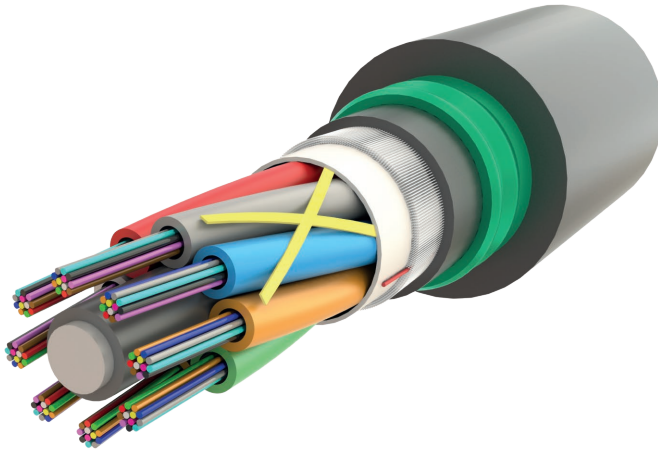
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1200 mm	1400 mm
Drum core diameter	500 mm	600 mm
Outside width	650 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, DJ, PE

Design Type **AT-D1Q(ZN-GY)2Y(SR)2Y-8D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Inner Jacket	UV Resistant PE
9	Armoured Material	Corrugated Steel
10	Outer Jacket	UV Resistant PE

### Properties

Corrugated Steel Armoured Outdoor Cable
Glass yarn strength member
Gel-filled tube
PE outer jacket for use in ducts and unprotected environments
Low fire load for high safety requirements
Longitudinal and transversal water resistant cable
Has a ripcord for easy stripping
Up to 96 Fibers
Double Jacket for Direct Burial

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1350 N
Crush Resistance	Installation	IEC 60794-1-21-E3	4000 N
	In Service		2000 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)2Y(SR)2Y-8D200-8x12-...-BK-Fca-2.7kN	96	8	0	2.0	14.6	195

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.0M2, G651.0M3, G651.0M4

\* Sample Code: 096F-AT-D1Q(ZN-GY)2Y(SR)2Y-8D200-8x12-2D-BK-Fca-2.7kN

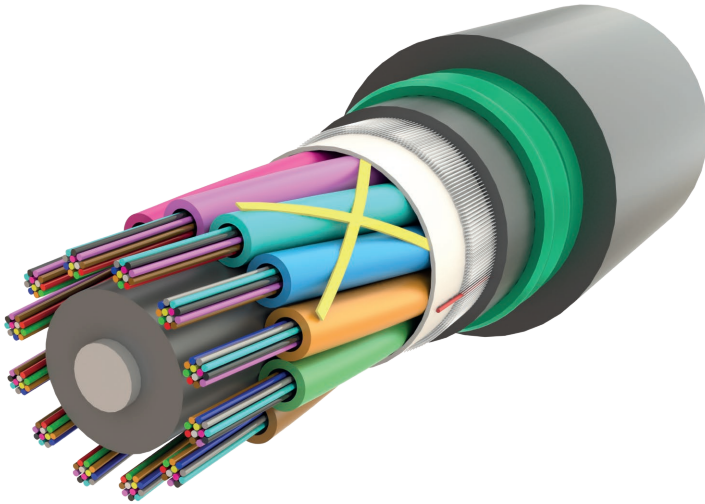
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1200 mm	1500 mm
Drum core diameter	600 mm	600 mm
Outside width	1000 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Steel Armoured, DJ, PE

Design Type **AT-D1Q(ZN-GY)2Y(SR)2Y-12D200**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	PBT
5	Water Blocking	Tape & Yarn
6	Ripcord	Polyester
7	Strength Member	Swellable Glass Yarn
8	Inner Jacket	UV Resistant PE
9	Armoured Material	Corrugated Steel
10	Outer Jacket	UV Resistant PE

### Properties

- Corrugated Steel Armoured Outdoor Cable
- Glass yarn strength member
- Gel-filled tube
- PE outer jacket for use in ducts and unprotected environments
- Low fire load for high safety requirements
- Longitudinal and transversal water resistant cable
- Has a ripcord for easy stripping
- Up to 144 Fibers
- Double Jacket for Direct Burial

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598)	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	4000 N
	In Service		2000 N
Crush Resistance	Installation	IEC 60794-1-21-E3	4000 N
	In Service		2000 N
Impact	-	IEC 60794-1-21-E4	Wp=10J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +50 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)2Y(SR)2Y-12D200-12x8-.-BK-Fca-4.0kN	96	12	0	2.0	17.0	258
144F-AT-D1Q(ZN-GY)2Y(SR)2Y-12D200-12x12-.-BK-Fca-4.0kN	144	12	0	2.0	17.0	258

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 144F-AT-D1Q(ZN-GY)B2Y-12D200-12x12-2D-BK-Fca-4.0kN

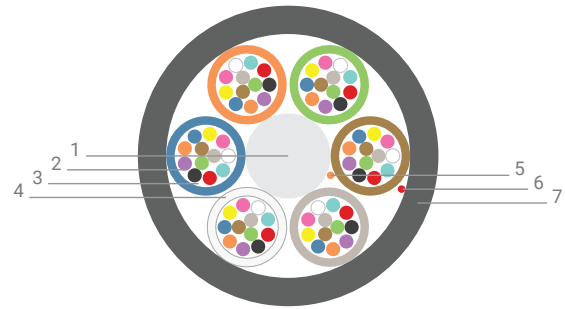
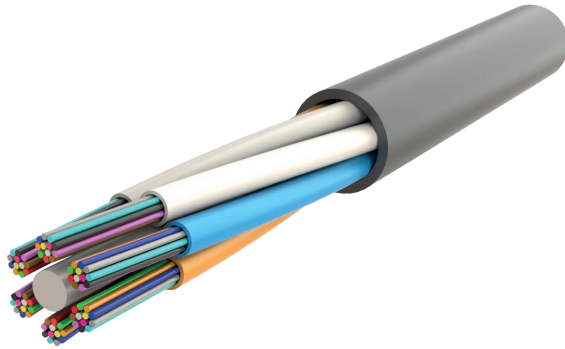
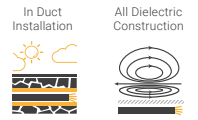
## Packaging

Drum length/Tolerance	2000 m ± 5%	4000 m ± 5%
Drum Flange diameter	1300 mm	1600 mm
Drum core diameter	600 mm	600 mm
Outside width	1000 mm	1000 mm

## MLT, Gel-Filled, Dry Core, Non Armoured, SJ, PE, Micro Duct

Design Type **AT-D3Q2Y-6D140**

Standards: IEC 60794-1 / IEC 60794-5 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Water Swellable Yarn
6	Ripcord	Polyester
7	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 72 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	500 N
	In Service		250 N
Crush Resistance	Installation	IEC 60794-1-21-E3	800 N
	In Service		400 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles



## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
002F-AT-D3Q2Y-6D140-1x2-...-BK-Fca-0.5kN	2	1	5	1.4	5.3	22
004F-AT-D3Q2Y-6D140-1x4-...-BK-Fca-0.5kN	4	1	5	1.4	5.3	22
004F-AT-D3Q2Y-6D140-2x2-...-BK-Fca-0.5kN	4	2	4	1.4	5.3	22
008F-AT-D3Q2Y-6D140-1x8-...-BK-Fca-0.5kN	8	1	5	1.4	5.3	22
008F-AT-D3Q2Y-6D140-2x4-...-BK-Fca-0.5kN	8	2	4	1.4	5.3	22
008F-AT-D3Q2Y-6D140-4x2-...-BK-Fca-0.5kN	8	4	2	1.4	5.3	22
012F-AT-D3Q2Y-6D140-1x12-...-BK-Fca-0.5kN	12	1	5	1.4	5.3	22
012F-AT-D3Q2Y-6D140-6x2-...-BK-Fca-0.5kN	12	6	0	1.4	5.3	22
016F-AT-D3Q2Y-6D140-2x8-...-BK-Fca-0.5kN	16	2	4	1.4	5.3	22
016F-AT-D3Q2Y-6D140-4x4-...-BK-Fca-0.5kN	16	4	2	1.4	5.3	22
024F-AT-D3Q2Y-6D140-2x12-...-BK-Fca-0.5kN	24	2	4	1.4	5.3	22
024F-AT-D3Q2Y-6D140-6x4-...-BK-Fca-0.5kN	24	6	0	1.4	5.3	22
048F-AT-D3Q2Y-6D140-4x12-...-BK-Fca-0.5kN	48	4	2	1.4	5.3	22
048F-AT-D3Q2Y-6D140-6x8-...-BK-Fca-0.5kN	48	6	0	1.4	5.3	22
072F-AT-D3Q2Y-6D140-6x12-...-BK-Fca-0.5kN	72	6	0	1.4	5.3	22

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 072F-AT-D3Q2Y-6D140-6x12-2D-BK-Fca-0.5kN

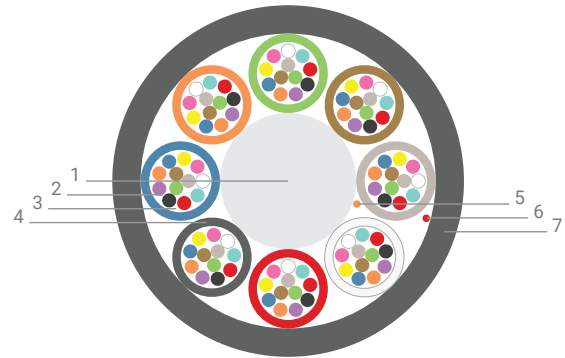
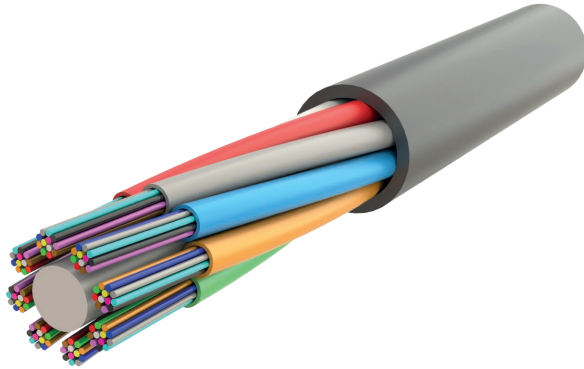
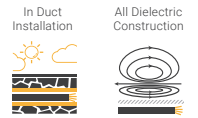
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	800 mm
Drum core diameter	400 mm
Outside width	600 mm

## MLT, Gel-Filled, Dry Core, Non Armoured, SJ, PE, Micro Duct

Design Type **AT-D3Q2Y-8D140**

Standards: IEC 60794-1 / IEC 60794-5 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Water Swellable Yarn
6	Ripcord	Polyester
7	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 72 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	1000 N
	In Service		500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	800 N
	In Service		400 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D3Q2Y-8D140-8x12-...-BK-Fca-1.0kN	96	8	0	1.4	6.2	32

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 096F-AT-D3Q2Y-8D140-8x12-2D-BK-Fca-1.0kN

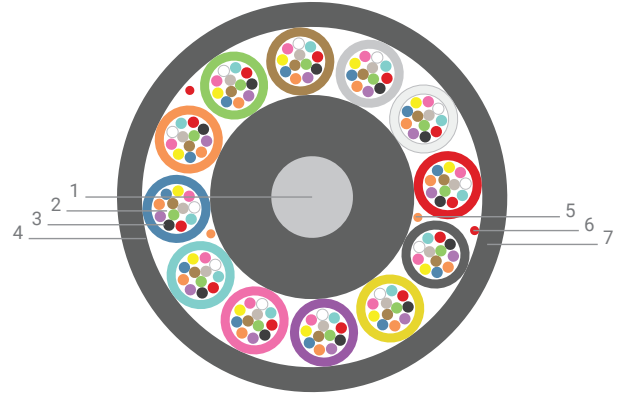
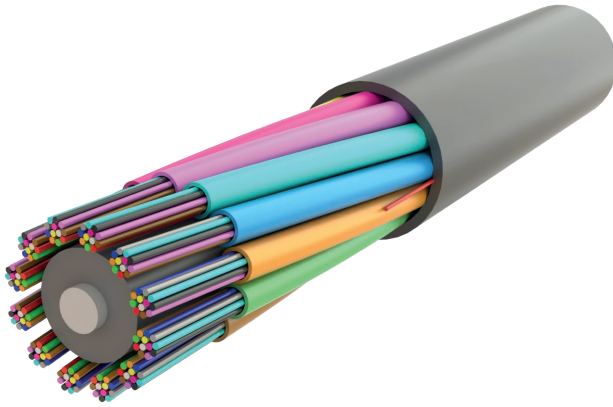
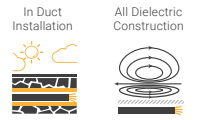
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	900 mm
Drum core diameter	400 mm
Outside width	650 mm

## MLT, Gel-Filled, Dry Core, Non Armoured, SJ, PE, Micro Duct

Design Type **AT-D3Q2Y-12D140**

Standards: IEC 60794-1 / IEC 60794-5 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Water Swellable Yarn
6	Ripcord	Polyester
7	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 144 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	800 N
	In Service		400 N
Crush Resistance	Installation	IEC 60794-1-21-E3	800 N
	In Service		400 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D3Q2Y-12D140-12x8-...-BK-Fca	96	12	0	1.4	8.0	50
144F-AT-D3Q2Y-12D140-12x12-...-BK-Fca	144	12	0	1.4	8.0	50

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 144F-AT-D3Q2Y-12D140-12x12-2D-BK-Fca

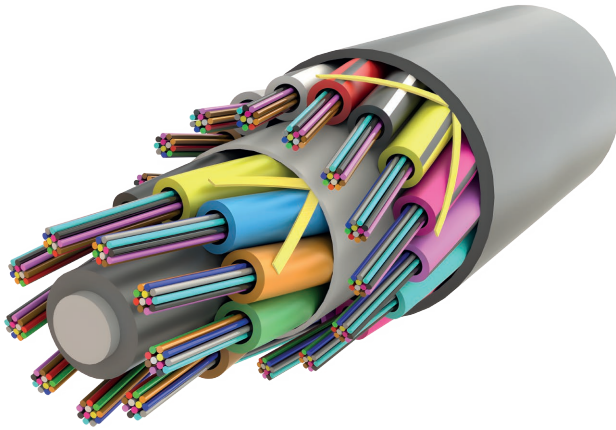
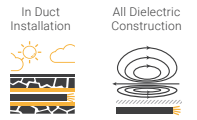
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	1200 mm
Drum core diameter	700 mm
Outside width	650 mm

## MLT, Gel-Filled, Dry Core, Non Armoured, SJ, PE, Micro Duct

Design Type **AT-D3Q2Y-24D140**

Standards: IEC 60794-1 / IEC 60794-5 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode 200μ
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Water Swellable Yarn
6	Ripcord	Polyester
7	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 288 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	1000 N
	In Service		500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	800 N
	In Service		400 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
288F-AT-D3Q2Y-24D140-24x12-...-BK-Fca-1.0kN	288	24	0	1.4	9.5	68

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 288F-AT-D3Q2Y-24D140-24x12-2D-BK-Fca-1.0kN

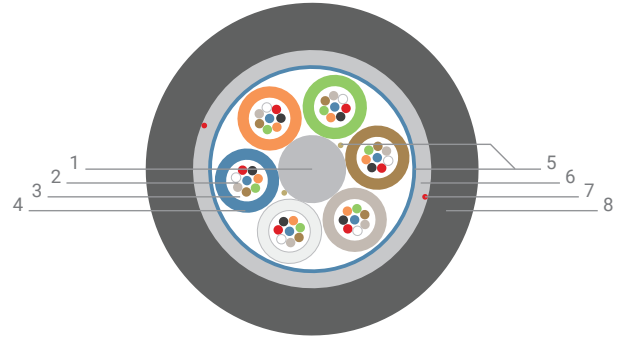
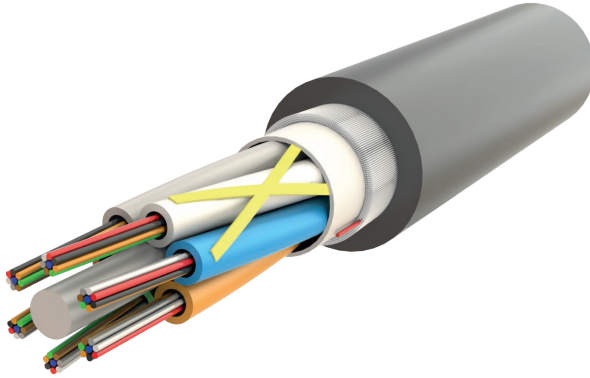
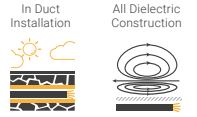
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	1200 mm
Drum core diameter	700 mm
Outside width	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE, Mini Duct

Design Type **AT-D1Q(ZN-GY)2Y-6D170**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 72 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2000 N
	In Service		1000 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles



## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
002F-AT-D1Q(ZN-GY)2Y-6D170-1x2-..-BK-Fca-2.7kN	2	1	5	1.7	8.8	61
004F-AT-D1Q(ZN-GY)2Y-6D170-1x4-..-BK-Fca-2.7kN	4	1	5	1.7	8.8	61
004F-AT-D1Q(ZN-GY)2Y-6D170-2x2-..-BK-Fca-2.7kN	4	2	4	1.7	8.8	61
008F-AT-D1Q(ZN-GY)2Y-6D170-1x8-..-BK-Fca-2.7kN	8	1	5	1.7	8.8	61
008F-AT-D1Q(ZN-GY)2Y-6D170-2x4-..-BK-Fca-2.7kN	8	2	4	1.7	8.8	61
008F-AT-D1Q(ZN-GY)2Y-6D170-4x2-..-BK-Fca-2.7kN	8	4	2	1.7	8.8	61
012F-AT-D1Q(ZN-GY)2Y-6D170-1x12-..-BK-Fca-2.7kN	12	1	5	1.7	8.8	61
012F-AT-D1Q(ZN-GY)2Y-6D170-6x2-..-BK-Fca-2.7kN	12	6	0	1.7	8.8	61
016F-AT-D1Q(ZN-GY)2Y-6D170-2x8-..-BK-Fca-2.7kN	16	2	4	1.7	8.8	61
016F-AT-D1Q(ZN-GY)2Y-6D170-4x4-..-BK-Fca-2.7kN	16	4	2	1.7	8.8	61
024F-AT-D1Q(ZN-GY)2Y-6D170-2x12-..-BK-Fca-2.7kN	24	2	4	1.7	8.8	61
024F-AT-D1Q(ZN-GY)2Y-6D170-6x4-..-BK-Fca-2.7kN	24	6	0	1.7	8.8	61
048F-AT-D1Q(ZN-GY)2Y-6D170-4x12-..-BK-Fca-2.7kN	48	4	2	1.7	8.8	61
048F-AT-D1Q(ZN-GY)2Y-6D170-6x8-..-BK-Fca-2.7kN	48	6	0	1.7	8.8	61
072F-AT-D1Q2(ZN-GY)Y-6D170-6x12-..-BK-Fca-2.7kN	72	6	0	1.7	8.8	61

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 072F-AT-D1Q2(ZN-GY)Y-6D170-6x12-2D-BK-Fca-2.7kN

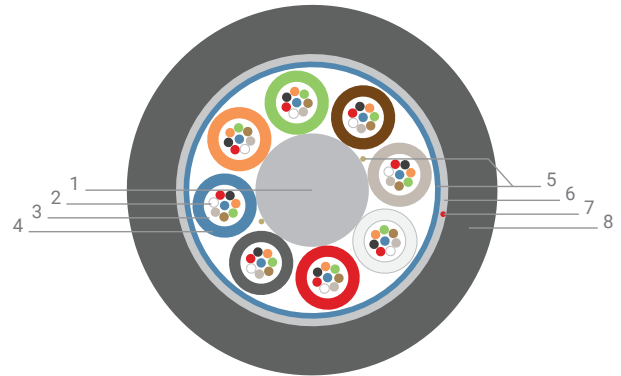
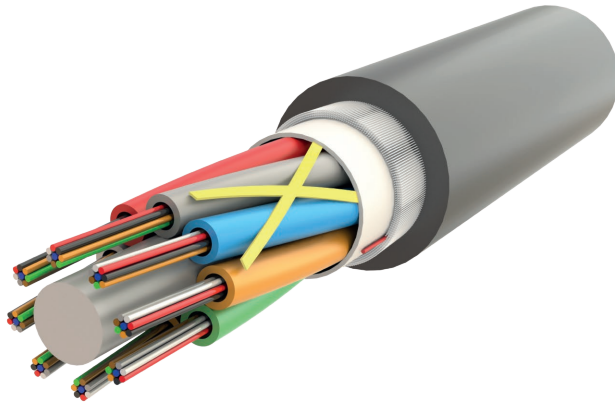
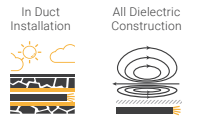
## Packaging

Drum length/Tolerance	4000 m $\pm$ 5%
Drum Flange diameter	1000 mm
Drum core diameter	400 mm
Outside width	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE, Mini Duct

Design Type **AT-D1Q(ZN-GY)2Y-8D170**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 96 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2000 N
	In Service		1000 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)2Y-8D170-8x12-...-BK-Fca-2.7kN	96	8	0	1.7	9.8	77

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 096F-AT-D1Q(ZN-GY)2Y-8D170-8x12-2D-BK-Fca-2.7kN

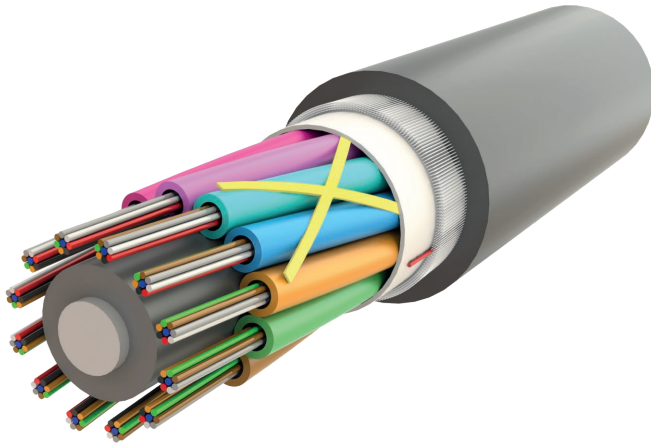
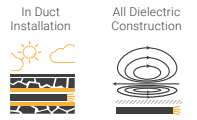
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	1000 mm
Drum core diameter	400 mm
Outside width	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE, Mini Duct

Design Type **AT-D1Q(ZN-GY)2Y-12D170**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 144 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2000 N
	In Service		1000 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
096F-AT-D1Q(ZN-GY)2Y-12D170-12x8-...-BK-Fca-2.7kN	96	12	0	1.7	11.7	106
144F-AT-D1Q(ZN-GY)2Y-12D170-12x12-...-BK-Fca-2.7kN	144	12	0	1.7	11.7	106

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 144F-AT-D1Q(ZN-GY)2Y-12D170-12x12-2D-BK-Fca-2.7kN

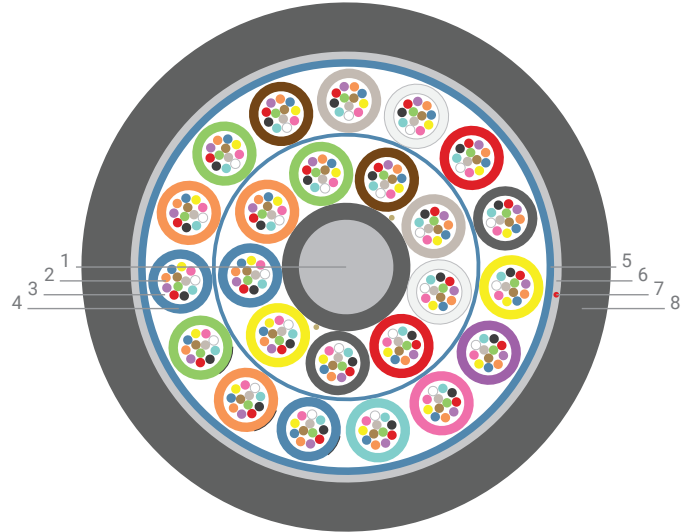
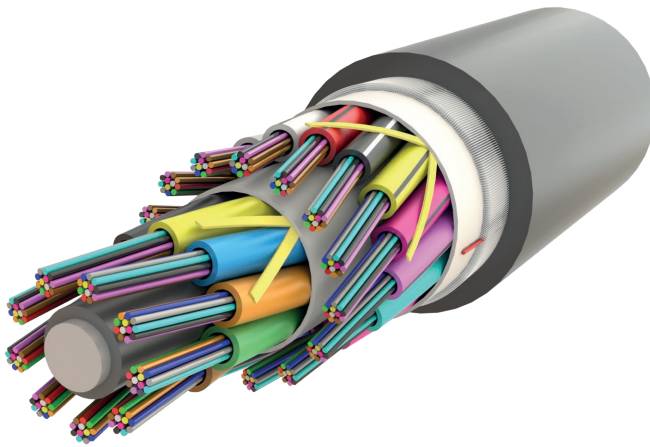
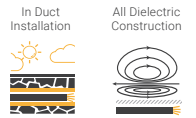
## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	1200 mm
Drum core diameter	550 mm
Outside width	1000 mm

## MLT, Gel-Filled, Dry Core, Non-Metallic Armoured, SJ, PE, Mini Duct

Design Type **AT-D1Q(ZN-GY)2Y-24D170**

Standards: IEC 60794-1 / IEC 60794-3 / IEC 60793-1



### Cable Construction

1	Central Strength Member	FRP / PE Coating
2	Fiber	Single-mode or Multi-mode
3	Tube Filling Material	Thixotropic Gel
4	Loose Tube	Thermoplastic
5	Water Blocking	Tape & Yarn
6	Strength Member	Swellable Glass Yarn
7	Ripcord	Polyester
8	Outer Jacket	UV Resistant PE

### Properties

Metal free outdoor cable with gel filled tubes  
Ripcord for easy stripping  
Designed to be rapidly installed by blowing  
Longitudinal and transversal watertight cable  
PE outer jacket for use in ducts and unprotected environments  
Up to 288 Fiber

### Identification

Print Color	White	(length marking 1 m intervals)
Sub-Unit Identification	Tube Coloring and Fiber Coloring; According to coloring code (ANSI/TIA-598 )	
Cable Printing	SAMM, Design Type, Fiber Count, Fiber Type, WO Number, Date, Meter	

### Mechanical Properties

Test	Conditions	Test Standard	Specified Value
Tensile Force	Installation	IEC 60794-1-21-E1	2700 N
	In Service		1500 N
Crush Resistance	Installation	IEC 60794-1-21-E3	2000 N
	In Service		1000 N
Impact	-	IEC 60794-1-21-E4	Wp=1J, R:30cm, 3 impacts
Repeated Bending	-	IEC 60794-1-21-E6	R= 20 x D, 35 cycles
Torsion	-	IEC 60794-1-21-E7	L:1 m, ±180°, 10 cycles
Cable Bending	-	IEC 60794-1-21-E11A	R= 20 x D, 4 turns, 3 cycles

## Environmental Properties

Property	Conditions	Test Standard	Result / Value
Temperature Range	Installation	IEC 60794-1-22-F12	-10 to +60 °C
	In Service		-30 to +70 °C
	Storage		-40 to +70 °C
Water Penetration	3 meter specimen, 1 m water altitude	IEC 60794-1-2-F5B	No leakage in 24 hours
Fire Propagation	Vertical single cable	IEC 60332-1-2	passed
Smoke Density	-	IEC 61034-2	passed
Halogen Acid Gas	Jacket material	IEC 60754-1	passed
Degree of Acidity	Jacket material	IEC 60754-2	passed
2011/65/EC (RoHS)	-	-	compliant
(EU) No 305/2011 (CPR)	-	EN 50575	Fca

## Ordering Codes

Order Code	Fiber Count	Tube Count	Filler Count	Tube Diameter (mm) nom.	Cable Diameter (mm) nom.	Cable Weight (kg) nom.
288F-AT-D1Q(ZN-GY)2Y-24D170-24x12-...-BK-Fca-2.7kN	288	24	0	1.7	14.0	146

\* Available fiber types are G652.D, G657.A1, G657.A2, G651.OM2, G651.OM3, G651.OM4

\* Sample Code: 288F-AT-D1Q(ZN-GY)2Y-24D170-24x12-2D-BK-Fca-2.7kN

## Packaging

Drum length/Tolerance	4000 m ± 5%
Drum Flange diameter	1400 mm
Drum core diameter	600 mm
Outside width	1000 mm











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