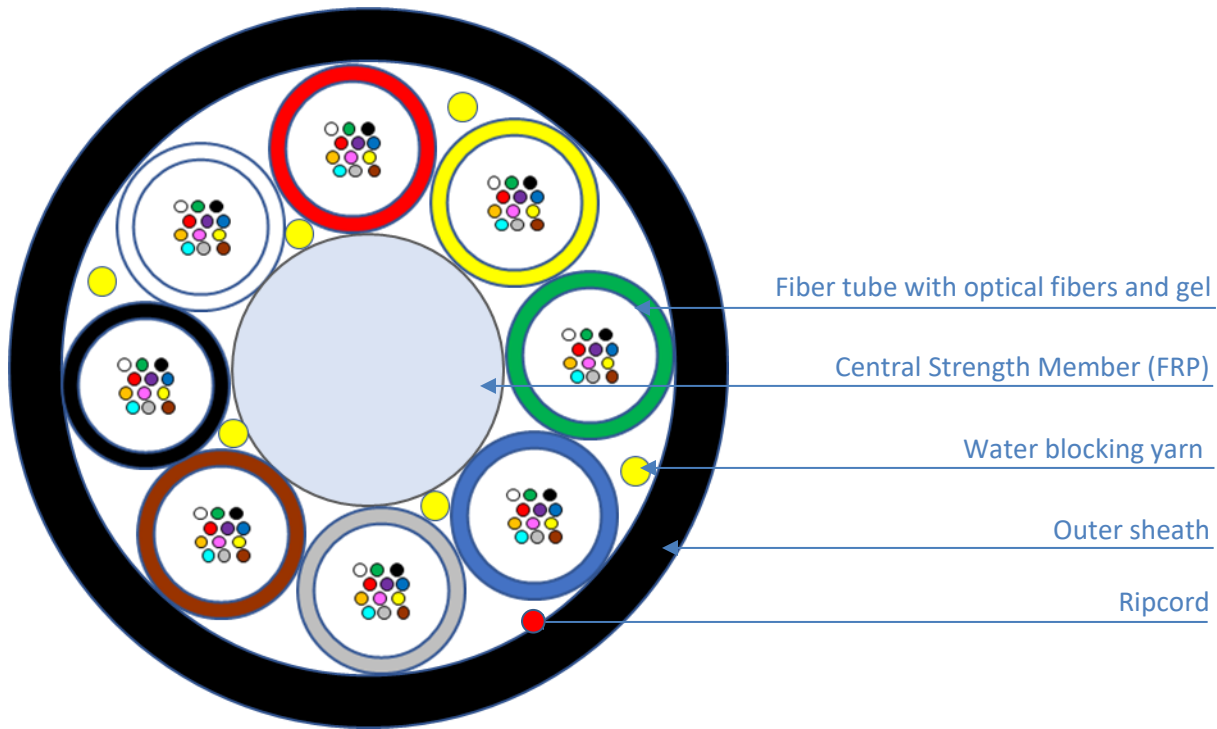





QXXE MICRO, FIBER OPTICAL MICRO BLOW CABLE FOR BLOWING INSTALLATION IN MICRO DUCTS



1. APPLICATION/CONSTRUCTION

Identification	QXXE MICRO - 12/24/48/96/144/192/216/288/432 G.652.D & G.657.A1+G.652.D		
Application	Micro duct installation by the means of blowing		
Cross section (not to scale)	12/24/48/96/144 fibers	192/216/288 fibers	432 fibers
			
Configuration	<ul style="list-style-type: none"> - Loose tubes with up to 24 optical fibers, filled with thixotropic compound. - Stranded loose tubes, SZ strand. - Central strength member made of fiber reinforced plastic (FRP), or coated FRP. - Cable strand: Dry, with water blocking yarns. - Outer sheath: HDPE, black, one ripcord under the sheath. 		
Temperature Range	Storage and transport -40 to +70°C	Installation -20 to +60°C	Operation -30 to +70°C
Standards	IEC 60793-1, IEC 60793-2, IEC 60794-5		
CPR	Fca (EN 50575:2014+A1:2016)		

2. DIMENSIONS

Number of fibers	/	12	24	48	96	144	192	216	288	432
Loose tube x fibers	/	1x12	2x12	4x12	8x12	12x12	16x12	18x12	24x12	18x24
Loose tube/Dummies	/	1/5	2/4	4/2	8/0	12/0	4/0 12/2	6/0 12/0	9/0 15/0	6/0 12/0
Loose tube \varnothing ($\pm 0,1$)	mm	1.4								2.0
CSM (FRP)	mm	1.4			2.4	4.2 (2.4)	1.4		2.8	2.1
Outer sheath thickness	mm	0,45								0.5
Outer diameter ($\pm 0,2$)	mm	5.1			6.1	7.9			9.3	11.1
Weight/km	KG	29			42	60	58		83	99

Sizes and values without tolerances are nominal values, sheath thickness does not consider ripcord portion.

3. MECHANICAL PROPERTIES

Number of fibers		12	24	48	96	144	192	216	288	432
Max tensile load	N	600			800		600		1000	
Crush resistance/10 cm	N	200 (Long term) / 500 (Short term)								
Bending radius (Dynamic)	/	20 x OD								
Bending radius (Static)	/	12 x OD								
Loose tube bending radius	mm	50								

See point 6: Test Methods

4. MARKING

Fiber colors	1	2	3	4	5	6	7	8	9	10	11	12
	White	Red	Yellow	Green	Blue	Grey	Brown	Black	Violet	Aqua	Orange	Pink
	13	14	15	16	17	18	19	20	21	22	23	24
	White	Red	Yellow	Green	Blue	Grey	Brown	Slate	Violet	Aqua	Orange	Pink

Tube colors 12~144F	1	2	3	4	5	6	7	8	9	10	11	12
	White	Red	Yellow	Green	Blue	Grey	Brown	Black	Violet	Aqua	Orange	Pink
Tube colors 192/216/432F Inner layer	1	2	3	4	5	6						
	White	Red	Yellow	Green	Blue	Grey						
Tube colors 192/432F Outer layer	7	8	9	10	11	12	13	14	15	16	17	18
	White	Red	Yellow	Green	Blue	Grey	Brown	Black	Violet	Aqua	Orange	Pink

Tube colors 288F Inner layer	1	2	3	4	5	6	7	8	9			
	White	Red	Yellow	Green	Blue	Grey	Brown	Black	Violet			
Tube colors 288F Outer layer	10	11	12	13	14	15	16	17	18	19	20	21
	White	Red	Yellow	Green	Blue	Grey	Brown	Black	Violet	Aqua	Orange	Pink
	22	23	24									
	Aqua	Orange	Pink									

Remark:

13~24th fiber color: Same as 1~12 fiber with black ring. Except 20th fiber color is natural with black ring

192/216F/432F cable: 7~16th tubes with black tracer, except 14th with white tracer.

192F cable has two dummies in outer layer

288F cable: 10~21st tube with black tracer, except 17th tube with white tracer. 22~24th tube no tracer.

Cable sheath marking G.652.D fiber: Black, ink jet white print marking with 1-meter intervals:

ALLOPTIX/FIBERWORKS QXXE-MICRO <n> G.652D <batch ID> <meter marking>

Cable sheath marking G.657.A1+G.652.D fiber: Black, ink jet white print marking with 1-meter intervals:

ALLOPTIX/FIBERWORKS QXXE MICRO <n> G.657.A1+G.652.D <batch ID> <meter marking>

<n>: Fiber qty.

5. OPTICAL FIBER CHARACTERISTICS

5.1 ITU-T G.652.D

Standard	ITU-T G.652D ZTT-ALF®		
Optical	Fiber attenuation, cabled	1310 nm: 0.36dB/km	1383 nm: ≤0.36dB/km
		1550 nm: 0.22dB/km	1625 nm: ≤0.24dB/km
	Mode Field Diameter (MFD)	1310 nm: 9.2 ± 0.4µm	1550 nm: 10.4 ± 0.6µm
	Zero dispersion wavelength	1300~1324 nm	
	Zero dispersion slope	≤0.092 ps/nm ² ·km	
	Polarization mode dispersion (PMD)	≤0.2 ps/√km	
	Cut-off wavelength	≤1260 nm	
	Macro bending loss 100 turns ø50 mm	1550 nm: ≤0.05 dB	1625 nm: ≤0.10 dB
	Outer diameter (uncolored)	245 ± 10 µm	
	Cladding diameter	125 ± 1.0 µm	
	Core/clad concentricity error	≤0.6 µm	
	Cladding non-circularity	≤1.0 %	

Mechanical	Proof stress	≥0.69 Gpa
Geometric	Cladding diameter	125 ± 0,7 μm
	Core/clad concentricity error	≤0.5 μm
	Cladding non-circularity	≤1.0 %

5.2 ITU-T G.657.A1+G.652.D

Standard	ITU-T G.657.A1+G.652.D TELE WEAVE-Premium™R10		
Optical	Fiber attenuation, cabled	1310 nm: 0.36dB/km	1383 nm: ≤0.36dB/km
		1550 nm: 0.22dB/km	1625 nm: ≤0.24dB/km
	Mode Field Diameter (MFD)	1310 nm: 9.2 ± 0.4μm	1550 nm: 10.4 ± 0.6μm
	Zero dispersion wavelength	1300~1324 nm	
	Zero dispersion wavelength	1300~1324 nm	
	Zero dispersion slope	≤0.092 ps/nm ² ·km	
	Polarization mode dispersion (PMD)	≤0.1 ps/√km	
	Cut-off wavelength	≤1260 nm	
	Makro bending loss 10 turns ø30mm 1 turn ø20mm 1 turn ø15mm	1550 nm: ≤0.03 dB ≤0.1 dB ≤0.5 dB	1625 nm: ≤0.1 dB ≤0.2 dB ≤1.0 dB
Geometric	Outer diameter (uncolored)	245 ± 10 μm	
	Cladding diameter	125 ± 1.0 μm	
	Core/clad concentricity error	≤0.6 μm	
	Cladding non-circularity	≤1.0 %	
Mechanical	Proof stress	≥0.69 Gpa	

6. TEST METHODS

Test	Conditions	Acceptance criteria
Tensile Strength IEC 60794-1-2 E1	Tensile load: see Point 3 Sample length: ≥ 50 m Test duration: 1 min	- Fiber strain ≤0.6% - Δα reversible - No damage
Crush resistance IEC 60794-1-2 E3	Crush: see Point 3 Test duration: 5 min Number of tests: 3	- Δα ≤0,1dB - Δα reversible - No damage
Impact IEC 60794-1-2 E4	Impact energy: 10J R=300mm Impact points: 3 Impact number: 1	- No additional attenuation - No damage

Bend IEC 60794-1-2 E11A	Mandrel radius: 15D Turn number: 5 Cycles: 3	- No additional attenuation - No damage
Repeated bending IEC 60794-1-2 E6	Bending radius: 20x cable dia. 25N, 35 cycles	- No additional attenuation - No damage
Torsion IEC 60794-1-2 E7	Sample length: 2 m: Angles: $\pm 180^\circ$ Cycles: 5, 40N	- No additional attenuation - No damage
Temperature cycling IEC 60794-1-2 F1	Steps: $-30^\circ\text{C}\sim+70^\circ\text{C}$ 12 hours, Cycles: 2	- $\Delta\alpha \leq 0.15$ dB/km - Attenuation reversible - No damage
Water penetration IEC 60794-1-2 F5	Sample length: 3 m Water column height: 1 m, 24 h	-No water leak through the open end in 24h
Filling compound flow IEC 60794-1-2-E14	Sample length: 0.2 m 60°C, 24 h	-No compound flow from the cable in 24 h

7. ORDERING INFORMATION

Elnr.	Product code	Product	Fiber qty	Fiber type	Category (fiber)
	K-QXEM-S-7A1-G12	QXXE MICRO, 12x G.657.A1+G.652.D	12	SM 9/125	OS2
	K-QXEM-S-7A1-G24	QXXE MICRO, 24x G.657.A1+G.652.D	24	SM 9/125	OS2
	K-QXEM-S-7A1-G48	QXXE MICRO, 48x G.657.A1+G.652.D	48	SM 9/125	OS2
	K-QXEM-S-7A1-G96	QXXE MICRO, 96x G.657.A1+G.652.D	96	SM 9/125	OS2
	K-QXEM-S-7A1-G144	QXXE MICRO, 144x G.657.A1+G.652.D	144	SM 9/125	OS2
	K-QXEM-S-7A1-G192	QXXE MICRO, 192x G.657.A1+G.652.D	192	SM 9/125	OS2
	K-QXEM-S-7A1-G216	QXXE MICRO, 216x G.657.A1+G.652.D	216	SM 9/125	OS2
	K-QXEM-S-7A1-G288	QXXE MICRO, 288x G.657.A1+G.652.D	288	SM 9/125	OS2
	K-QXEM-S-7A1-G432	QXXE MICRO, 432x G.657.A1+G.652.D	432	SM 9/125	OS2
	K-QXEM-S-G2D-G12	QXXE MICRO, 12x G.652D	12	SM 9/125	OS2
	K-QXEM-S-G2D-G24	QXXE MICRO, 24x G.652.D	24	SM 9/125	OS2

	K-QXEM-S-G2D-G48	QXXE MICRO, 48x G.652.D	48	SM 9/125	OS2
	K-QXEM-S-G2D-G96	QXXE MICRO, 96x G.652.D	96	SM 9/125	OS2
	K-QXEM-S-G2D-G144	QXXE MICRO, 144x G.652.D	144	SM 9/125	OS2
	K-QXEM-S-G2D-G192	QXXE MICRO, 192x G.652.D	192	SM 9/125	OS2
	K-QXEM-S-G2D-G216	QXXE MICRO, 216x G.652.D	216	SM 9/125	OS2
	K-QXEM-S-G2D-G288	QXXE MICRO, 288x G.652.D	288	SM 9/125	OS2
	K-QXEM-S-G2D-G432	QXXE MICRO, 432x G.652.D	432	SM 9/125	OS2

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