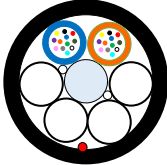

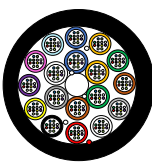


## 1. Application / Construction

Identification	OFC-12/24/48/96/144/192/288/432/576 G.652D+G.657A1-F-MD-S1 BlownElite™ OFC-12/24/48/96/144/192/288/432/576 G.652D-F-MD-S1 BlownElite™		
Application	Micro duct blowing installation		
Cross Section (not to scale)	12/24/48/96/144 fibers 	192/216/288 fibers 	144/192/288/432/576 fibers 
	<ul style="list-style-type: none"> <li>- Loose tubes with up to 24 optical fibers, filled with thixotropic compound</li> <li>- Stranded loose tubes</li> <li>- Central strength member made of fibre reinforced plastic (FRP) or coated FRP.</li> <li>- Cable strand: dry, with water blocking yarns</li> <li>- Outer sheath: HDPE, black, one ripcord under the sheath</li> </ul>		
Temperature Range	Storage and transport -30 to +60°C	Installation -20 to +50°C	Operation -30 to +60°C
Standards	IEC 60793-1, IEC 60793-2, IEC 60794-5		
ZTT Specification	ZTT 20-112223-G		
Customer Reference	Common standard		

## 2. Dimensions

### 2.1 12~288F 250μm

Number of fibers	/	12	24	48	96	144	192	216	288	432
Loose tubes x fibers	/	1x12	2x12	4x12	8x12	12x12	16x12	18x12	24x12	18x24
Loose tubes / Dummies	/	1/5	2/4	4/2	8/0	12/0	(4+12)/2	(6+12)/0	(9+15)/0	(6+12)/0
Outer diameter (±0.2)	mm	5.1			6.1	7.9	7.9		9.3	11.1±0.3
For micro-duct inside	mm	8~12			8~12	10~14			12~14	16~20
Weight/km	kg	29			42	60	58		83	99

### 2.2 144~288F (12F/T) 200μm

Number of fibers	/	144	192	216	288
Loose tubes x fibers	/	12x12	16x12	18x12	24x12
Loose tubes / Dummies	/	12/0	(6+10)/4	(6+12)/2	(9+15)/0
Outer diameter (±0.2)	mm	7.6	7.9		8.9
For micro-duct inside	mm	10~14			12~14
Weight/km	kg	55	60		75

### 2.3 144~576F (24F/T)200 μm

Number of fibers	/	192	288	432	576
Loose tubes x fibers	/	8x24	12x24	(6+12)x24	(9+15)x24
Loose tubes / Dummies	/	8/0	12/0	18/0	24/0
Outer diameter	mm	7.6±0.2	10.0±0.3	10.0±0.3	11.8±0.3
For micro-duct inside	mm	12~14	14~16	14~16	16~20
Weight/km	kg	60	93	90	118

## 2.4 288F G.652D 180 μm

Number of fibers	/	288
Loose tubes x fibers	/	24x12
Loose tubes / Dummies	/	(9+15)/0
Outer diameter (±0.3)	mm	8.0
For micro-duct inside	mm	10
Weight/km	kg	63

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

## 3. Mechanical Properties

Number of fibers	12	24	48	96	144	192	216	288	144	192	288	432	576
Counts per tube	12								24				
Max. tensile load (N)	600			800		600		1000	800	1000	1200	1000	1200
Crush resistance / 10 cm	200 N(long term) / 500 N(short term)												
Bending radius (installation)	20x cable-Ø												
Bending radius (operation)	15x cable-Ø												

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
	1	2	3	4	5	6	7	8	9	10	11	12
	white	red	yellow	green	blue	grey	brown	natural	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 192/216/432F 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 192/288F (24F/T)	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 288/576F inner layer	1	2	3	4	5	6	7	8	9			
	white	red	yellow	green	blue	grey	brown	black	violet			
Tube Colors 288/576F 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
Tube Colors 288/576F outer layer	22	23	24									
	aqua	orange	pink									

Tube Colors 288F(180um) inner layer	1	2	3	4	5	6	7	8	9			
	white	red	yellow	green	blue	grey	brown	black	violet			
Tube Colors 288F(180um) 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
Tube Colors 288F(180um) outer layer	22	23	24									
	aqua	orange	pink									

Remark: 1. 13~24<sup>th</sup> fiber color: same as 1~12 fiber with black ring, except 20<sup>th</sup> fiber color is natural with black ring  
 2. For 192/216/432F cable: 7~18<sup>th</sup> tubes with black tracer, except 14<sup>th</sup> with white tracer  
 3. For 288F & 576F cable: 10~21<sup>th</sup> tubes with black tracer, except 17<sup>th</sup> with white tracer

Outer Sheath: black, ink jet print, marking in 1 metre intervals as follows:

ZTT    OPTICAL CABLE    OFC-12G.652D- F-MD-S1    <batch ID>    <meter marking >

## 5. Optical Fiber

Standard	ITU-T G.652D+G.657A1 TELE WEAVE-Premium™R10		
Optical	Fibre attenuation .. after cabled	@ 1310 nm ≤0.36 dB/km	@ 1550 nm ≤0.23 dB/km
	Mode field diameter (MFD)	9.2 ± 0.4 μm	
	Zero dispersion wavelength	1300~1324 nm	
	Zero dispersion slope	≤0.092 ps/nm <sup>2</sup> · km	
	Cut-off wavelength	≤1260 nm	
	Macro bending loss .. 10 turns Ø30 mm	@1550 nm ≤0.2 dB	@1625 nm ≤0.5 dB
	.. 1 turn Ø20 mm	≤0.3 dB	≤1.0 dB
.. 100 turns Ø50 mm	≤0.035 dB	≤0.035 dB	
Geometric	Outer diameter (uncolored)	200/245 ± 10 μm	
	Cladding diameter	125 ± 0.7 μm	
	Core/clad concentricity error	≤0.5 μm	
	Cladding non-circularity	≤1.0 %	
Mechanical	Proof stress	≥0.69 Gpa	

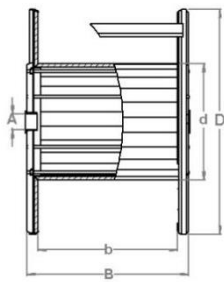
Standard	ITU-T G.652D ZTT-ALF®		
Optical	Fibre attenuation .. cabled	@ 1310 nm ≤0.36 dB/km	@ 1550 nm ≤0.22 dB/km
	Mode field diameter (MFD)	9.2 ± 0.4 μm	10.4 ± 0.6 μm
	Zero dispersion wavelength	1300~1324 nm	
	Zero dispersion slope	≤0.092 ps/nm <sup>2</sup> · km	
	Polarisation mode dispersion (PMD)	≤0.2 ps/√km	
	Cut-off wavelength	≤1260 nm	
	Macro bending loss .. 100 turns Ø50 mm	@1550 nm ≤0.05 dB	@1625 nm ≤0.10 dB
Geometric	Outer diameter (uncolored)	245/200/180 ± 10μm	
	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	- Δα reversible - No damage
Crush resistance IEC 60794-1-2 E3	Crush: see Point 3 Test duration: 1 min, number of tests: 3	- Δα reversible - No damage
Impact IEC 60794-1-2 E4	Impact energy: 1J; R = 300 mm Impact points: 3; Impact number: 1	- Δα reversible - No damage
Torsion IEC 60794-1-2 E7	Sample length: 2 m; Angles: ± 180° Cycles: 10 cycles	- Δα reversible - No damage
Bend IEC 60794-1-2 E11A	Mandrel radius: 15D; Turn number: 4 Cycles: 3 cycles	- Δα reversible - No damage
Temperature cycling IEC 60794-1-2 F1	Steps: -30°C~+60°C, 12 hours Cycles: 2	- Δα ≤ 0.15 dB/km and attenuation reversible - No damage
Water penetration IEC 60794-1-2 F5	Sample length: 3 m Water column height: 1 m 24 h	- No water leakage

All optical measurements at 1550 nm

## 7. Logistics

Cable type	Length	6 km (-1% / +3%)	 <p>D*d*B in cm</p>
OFC-12/24/48/... (12F/T) 250μm	Drum type: Wooden Dimensions Weight	95*50*75 (230 kg)	
OFC-96... (12F/T) 250μm		105*60*75 (281 kg)	
OFC-144... (12F/T) 250μm		125*60*75 (444 kg)	
OFC-192/216... (12F/T) 250μm		135*80*75 (458 kg)	
OFC-288... (12F/T) 250μm		145*80*75 (621 kg)	
OFC-288... (12F/T) 180μm		135*80*75 (488 kg)	
OFC-144... (12F/T) 200μm		105*60*110 (416 kg)	
OFC-192/216... (12F/T) 200μm		135*80*75 (470 kg)	
OFC-288 ... (12F/T) 200μm		145*90*75 (573 kg)	
OFC-192 ... (24F/T) 200μm		135*80*75 (470 kg)	
OFC-288 ... (24F/T) 200μm		155*80*75 (701 kg)	
OFC-432 ... (24F/T) 200μm		155*90*75 (685 kg)	
OFC-432 ... (24F/T) 250μm		165*90*75 (753 kg)	
OFC-576 ... (24F/T) 200μm		175*100*75 (881 kg)	

Dimensions including protection. Indicative values, actually delivered drum sizes and weights may deviate. Cable ends sealed with caps.

G	Jul 16, 2021	Dendi	Erica	Xue Zhaojian	Add 288f cable with G.652D 180um fiber
F	Nov 16, 2020	Eden	Yury	Felix	Change tube colors
E	Sep 23, 2020	Eden	Yury	Felix	Add 432/288
D	Sep 23, 2020	Eden	Yury	Felix	Add G.652D
C	Sep 23, 2020	Eden	Yury	Felix	Add 250um
B	Sep 22, 2020	Eden	Yury	Felix	200um applied
A	Sep 17, 2020	Eden	Yury	Felix	/

Version	Date	Prepared	Reviewed	Approved	Remark
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