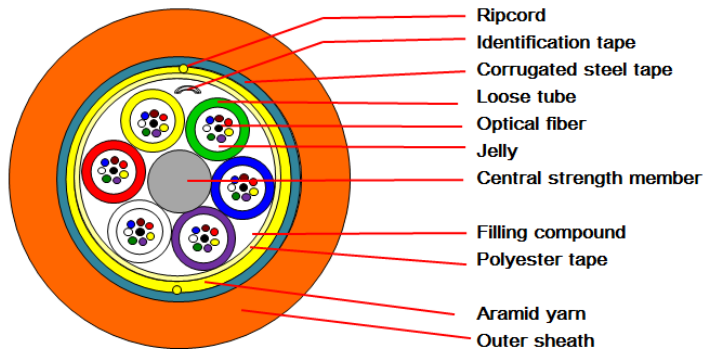


GYFTS

1. Cable cross-section



BOROPTİK MÜHENDİSLİK
AR-GE İMALAT VE TİCARET A.Ş.
 Çayırlık Mahallesi Acıgöl OSB
 1.Cad. 3.Sok.No:10 Acıgöl/NEVŞEHİR
 Acıgöl / D. 045 3906

2. Cable Specification

2.1 Introduction

Loose tube construction, tubes jelly filled, elements (tubes and filler rods) and water blocking yarns laid up around non-metallic central strength member, polyester yarns used to bind the cable core, filling compound filled in the apertures of the cable core, polyester tape, then aramid yarns reinforced and corrugated steel tape and PE outer sheath(orange RAL2008).

2.2 Color codes

Color codes conform to the following table

48F

ORDER NO	FIBER TUBE COLOR	ORDER NO	FIBER COLORS
1	RED	1	RED
2	YELLOW	2	YELLOW
3	GREEN	3	GREEN
4	BLUE	4	BLUE
5	VIOLET	5	VIOLET
6	WHITE	6	BROWN
		7	BLACK
		8	NATURAL

96F

ORDER NO	FIBER TUBE COLOR	ORDER NO	FIBER COLORS
1	RED	1	RED
2	YELLOW	2	YELLOW
3	GREEN	3	GREEN
4	BLUE	4	BLUE
5	VIOLET	5	VIOLET
6	BROWN	6	BROWN
7	BLACK	7	BLACK



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8	ORANGE	8	ORANGE
9	PINK	9	
10	GRAY	10	
11	TURQUOISE	11	
12	NATURAL	12	

144F

ORDER NO	FIBER TUBE COLOR	ORDER NO	FIBER COLORS
1	RED	1	RED
2	YELLOW	2	YELLOW
3	GREEN	3	GREEN
4	BLUE	4	BLUE
5	VIOLET	5	VIOLET
6	BROWN	6	BROWN
7	BLACK	7	BLACK
8	ORANGE	8	ORANGE
9	PINK	9	PINK
10	GRAY	10	GRAY
11	TURQUOISE	11	TURQUOISE
12	WHITE	12	NATURAL

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Acıgöl Y.O.: 045 3906~~

288F

ORDER NO	FIBER TUBE COLOR	ORDER NO	FIBER COLORS
Inner 1	RED	1	RED
2	YELLOW	2	YELLOW
3	GREEN	3	GREEN
4	BLUE	4	BLUE
5	VIOLET	5	VIOLET
6	BROWN	6	BROWN
7	BLACK	7	BLACK
8	ORANGE	8	ORANGE
9	WHITE	9	PINK
Outer 1	RED	10	GRAY
2	YELLOW	11	TURQUOISE
3	GREEN	12	NATURAL
4	BLUE		
5	VIOLET		
6	BROWN		
7	BLACK		
8	ORANGE		
9	PINK		
10	GRAY		
11	TURQUOISE		



12	WHITE
13	RED with black strip
14	YELLOW with black strip
15	GREEN with black strip

BOROPTİK MÜHENDİSLİK
AR-GE İMALAT VE TİCARET A.Ş.
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 Acıgöl T.C. 045 3906

2.3 Cable structure and parameter

SN	Item	Unit	Value			
1	No. of fibers	count	48	96	144	288
2	No. of fibers per tube	count	8	8	12	12
3	No. of elements	count	6	12	12	9+15
4	CSM diameter	mm	2.2	2.2/6.8	2.8/6.8	2.8/4.5
5	Tube diameter(Nominal)	mm	Outer Diameter: 2.25mm $\pm$ 0.1mm Inner Diameter 1.70mm $\pm$ 0.1mm			
6	Outer sheath thickness together with the Corrugated Steel Tape	mm	2.1 $\pm$ 0.2			
7	Aramid Yarn Content (Nominal)	gt/mt	3	7	7	7
8	Cable diameter($\pm$ 5%)	mm	11.8	16.5	16.5	18.5
9	Cable weight($\pm$ 10%)	kg/km	141	260	267	350
10	Short term tension	N	2900	4900		
11	Ultimate tensile strength	N	4900	8000		
12	Short term crush	N/100mm	3000			

3. Characteristic of Optical Cable

3.1 Min. bending radius for installation

Static: 10 x cable diameter

Dynamic: 20 x cable diameter

3.2 Application temperature range

Operation: - 40°C ~ +80°C

Installation: -5°C ~ +70°C

Storage/transportation: - 40°C ~ +80°C

3.3 Main mechanical & environmental performance test

Item	Test Method	Acceptance Condition
Tensile Strength IEC 60794-1-2-E1	- Load: Short term tension - Length of cable: about 50m - Load time: 1min	- Fiber strain $\leq$ 0.33% - No fiber break and no sheath damage.
Crush Test IEC 60794-1-2-E3	- Load: Short term crush - Load time: 10min	- Loss change $\leq$ 0.05dB@1550nm - No fiber break and no sheath damage.
	- Load: 5000N - Load time: 1min	- No fiber break and no sheath damage.
Impact Test IEC 60794-1-2-E4	- Points of impact: 3 - Times of per point: 1	- Loss change $\leq$ 0.05dB@1550nm - No fiber break and no sheath damage.



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	- Impact energy: 3J	
Repeated Bending IEC 60794-1-2-E6	- Bending radius: 20 x OD - No. of cycle: 25	- Loss change $\leq 0.05\text{dB}@1550\text{nm}$ - No fiber break and no sheath damage.
Torsion IEC 60794-1-2-E7	- Length: 1m - Twist angle: $\pm 180^\circ$ - No. of cycle: 3	- Loss change $\leq 0.05\text{dB}@1550\text{nm}$ - No fiber break and no sheath damage.
Cable bend IEC 60794-1-2-E11	- Diameter of mandrel: 15 x OD - Number of turns: 5 - Number of cycles: 3	- Loss change $\leq 0.05\text{dB}@1550\text{nm}$ - No fiber break and no sheath damage.
Temperature Cycling IEC 60794-1-2-F1	- Temperature: $-40^\circ\text{C} \sim +80^\circ\text{C}$ - Time of each step: 36h - Number of cycle: 1	- Loss change $\leq 10\%$ - No fiber break and no sheath damage.
Water Penetration IEC 60794-1-2-F5B	- Height of water: 1m - Sample length: 1m - Time: 48h	- No water leak from the cable core of the opposite end
Kink Test IEC 60794-1-2-E10	- Bending radius: 20 x OD	- Loss change $\leq 0.05\text{dB}/\text{km}@1550\text{nm}$ - No fiber break and no sheath damage.

4. Characteristic of Optical Fiber

G652D fiber information

Mode field diameter (1310nm):	$9.2\mu\text{m} \pm 0.4\mu\text{m}$
Mode field diameter (1550nm):	$10.4\mu\text{m} \pm 0.5\mu\text{m}$
Cladding diameter:	$125\mu\text{m} \pm 0.7\mu\text{m}$
Coating diameter:	$245\mu\text{m} \pm 10\mu\text{m}$
Core/cladding concentricity error:	$\leq 0.6\mu\text{m}$
Cladding non-circularity:	$\leq 1.0\%$
Cut off wavelength of cabled fiber (λ_{cc}):	$\leq 1260\text{nm}$
Before Cabling(In Bare Fiber)	
Attenuation at 1310nm:	$\leq 0.34\text{dB}/\text{km}$
Attenuation at 1550nm:	$\leq 0.21\text{dB}/\text{km}$
Attenuation at 1625nm:	$\leq 0.22\text{dB}/\text{km}$
After Cabling (In Fiber Cable)	
Attenuation at 1310nm:	$\leq 0.36\text{dB}/\text{km}$
Attenuation at 1550nm:	$\leq 0.22\text{dB}/\text{km}$
Attenuation at 1625nm:	$\leq 0.24\text{dB}/\text{km}$
Bending loss at 1550nm (100 turns, 30mm radius):	$\leq 0.05\text{dB}$
Dispersion in the range 1288 to 1339nm:	$\leq 3.5\text{ps}/(\text{nm} \cdot \text{km})$
Dispersion at 1550nm:	$\leq 17\text{ps}/(\text{nm} \cdot \text{km})$
zero-Dispersion wavelength	$1300\text{nm} \sim 1322\text{nm}$
Dispersion slope at zero dispersion wavelength:	$\leq 0.092\text{ps}/(\text{nm}^2 \cdot \text{km})$
Polarization mode dispersion (individual fiber):	$\leq 0.2\text{ps}/\sqrt{\text{km}}$

