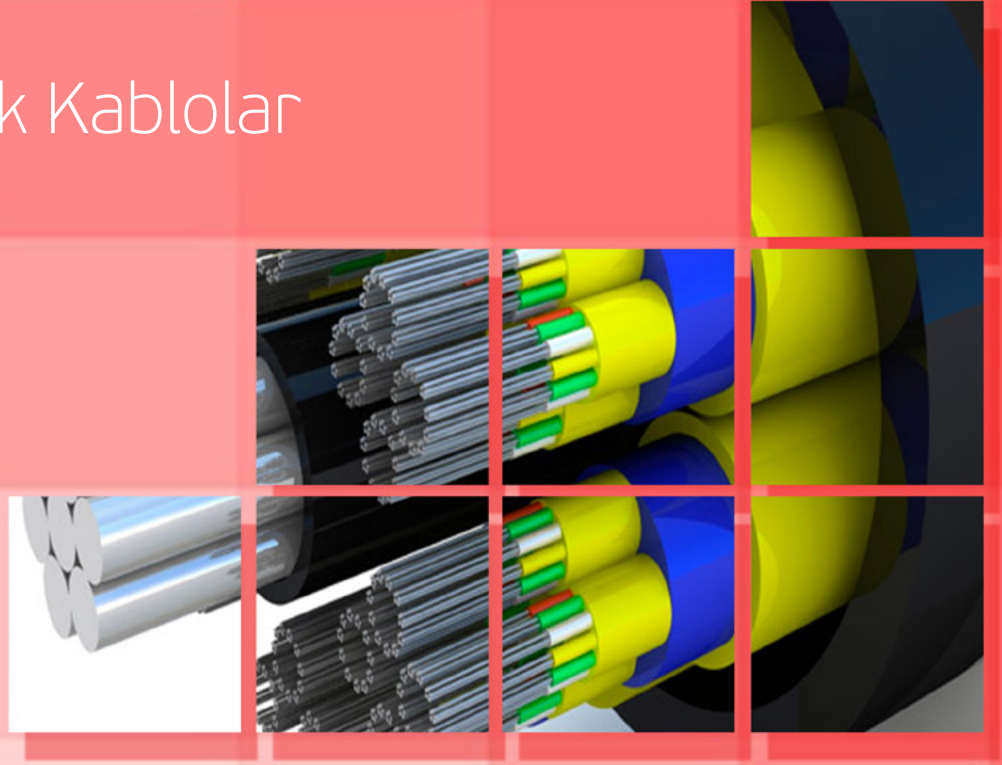




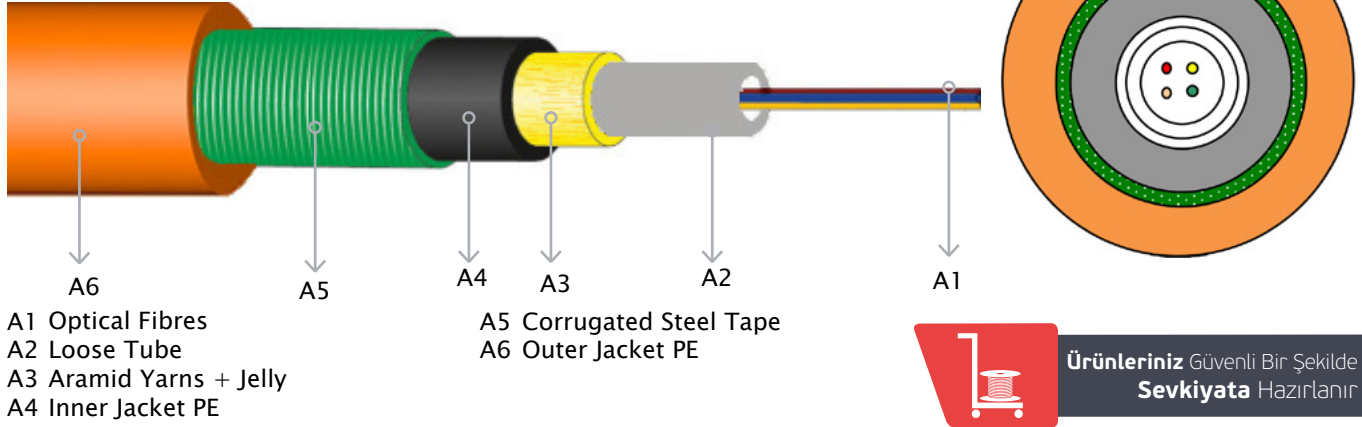
**Data Sheet**

## Fiber Optik Kablolar



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## 4 Core SM SLT DJSA F/O Cable



**Marka/Model : HES/HTS9SDJSA-004**  
**Türksat Onay Kodu : TKS-FOM-35**

### ❖ Physical Description

- ✦ 4 fibers armored fiber optic cable,
- ✦ Thixotropic jelly filled loose tubes,
- ✦ Central loose tube design,
- ✦ Jelly filled core,
- ✦ Aramid yarn as strength elements,
- ✦ Inner jacket is made of low density polyethylene,
- ✦ Corrugated steel tape armor,
- ✦ Outer jacket is made of medium density polyethylene,
- ✦ Ripcords are inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tube	Natural
Color of fibers in per tube	Red, Yellow, Green, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Strength elements	Aramid yarn
Ripcord	Aramid or polyester cord
Identification tape marking	As a customer request
Inner jacket	Black LDPE, thickness nominal 1.1±0.2 mm
Armor	Corrugated steel tape
Outer jacket	UV Resistant Orange MDPE, thickness nominal 1.8±0.2 mm. (jacket+armor)
Surface marking	As a customer request



### SPECIFICATIONS

Fiber Count	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
4	3.0±0.1/2.0±0.1	11.8*	135*

\*:Tolerance is ±10%

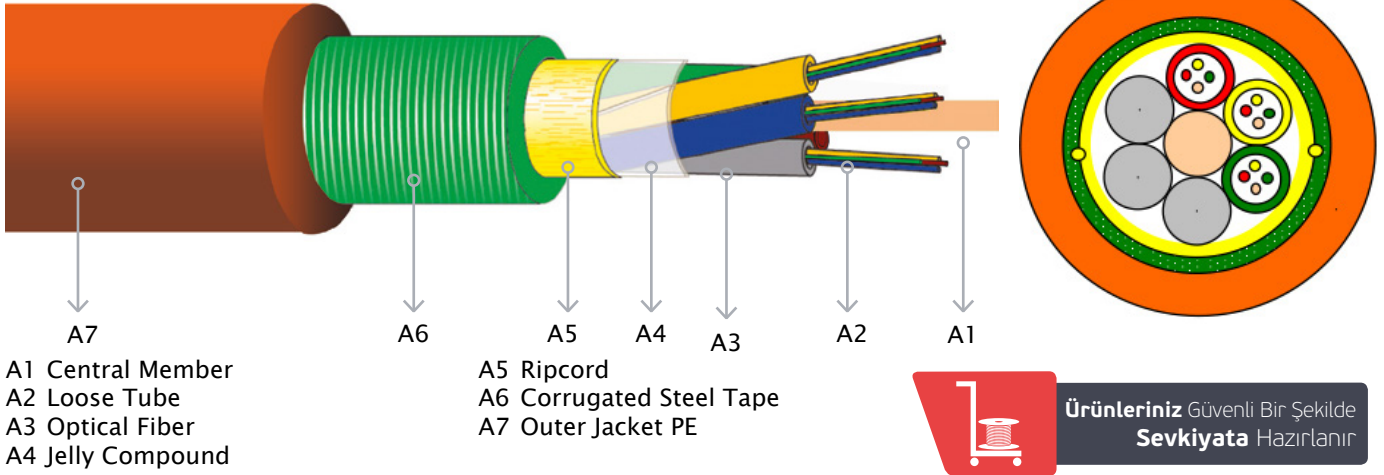
### Mechanical and Environmental Properties

Physical tests	Value	Requirement	Standard
Tensile Strength	1200 N (during installation) 700 N (during operation)	Max. loss:0.05 dB	IEC 60794-1-2-E1
Impact Resistance	5 N.m, 3 impacts	No fiber break	IEC 60794-1-2-E4
Crush Resistance	1500 N/100mm	No fiber break	IEC 60794-1-2-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-2-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-2-E11
Bend Radius (during Service)	15x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-2-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-2-F5

### STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.4±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 18 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core/Clad Concentricity error	≤ 0.5 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	≤ 0.7 %
Coating diameter	245±10 µm
Cut Off Wavelength	≤1260nm
Proof Test strain	≥ 1% (100kpsi or 0.7GPa)

## 12 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-012**  
**Türksat Onay Kodu :TKS-FOM-01**

### ❖ Physical Description

- ▶ 12 fibers armored outdoor fiber optic cable,
- ▶ Thixotropic jelly filled loose tubes,
- ▶ Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- ▶ Jelly filled core,
- ▶ Aramid yarn as strength elements,
- ▶ Corrugated steel armor,
- ▶ Outer jacket is made of medium density polyethylene,
- ▶ Ripcord is inserted for easy jackets removal.

### Physical Specifications

Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
12	3	3	4	2.2	N/A	2.0/1.4*	12.9*	163*

## Mechanical and Environmental Properties

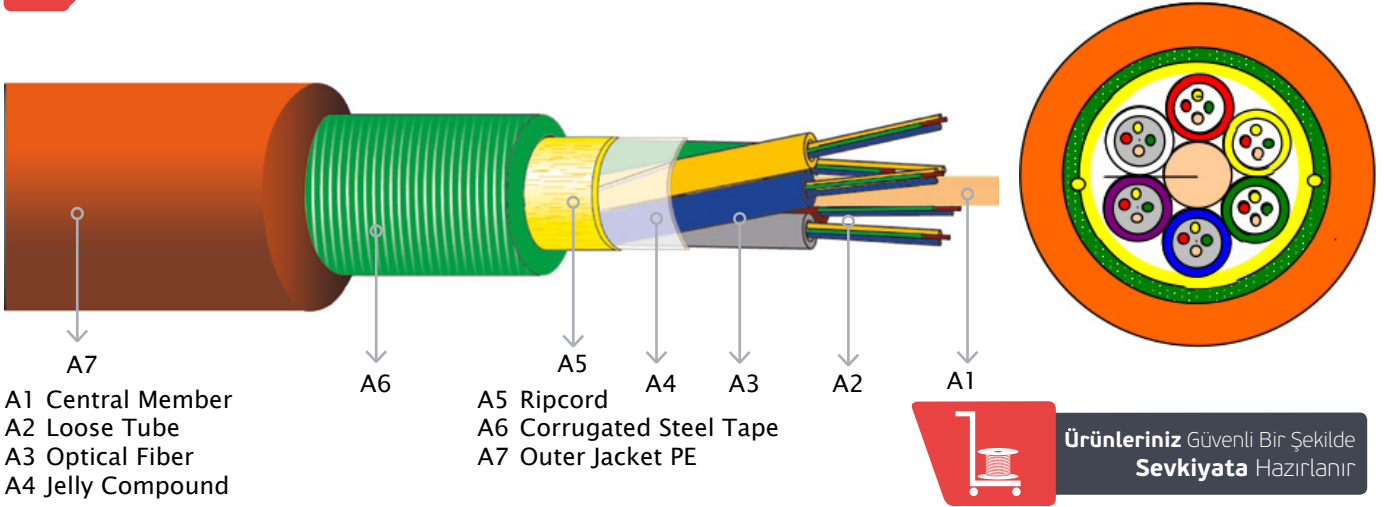
Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00



## 24 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-024**  
**Türksat Onay Kodu : TKS-FOM-02**

### Physical Description

- 24 fibers armored outdoor fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
24	6	-	4	2.2	N/A	2.0/1.4*	12.9*	165*

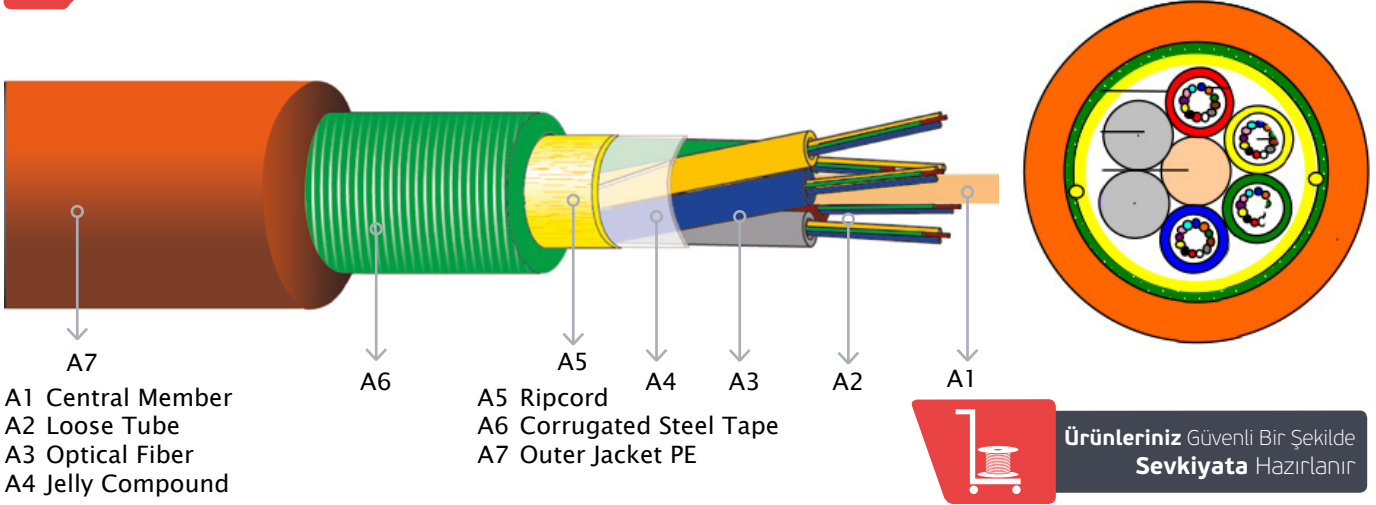
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 48 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-048**  
**Türksat Onay Kodu : TKS-FOM-**

### ❖ Physical Description

- ❖ 48 fibers armored outdoor fiber optic cable,
- ❖ Thixotropic jelly filled loose tubes,
- ❖ Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- ❖ Jelly filled core,
- ❖ Aramid yarn as strength elements,
- ❖ Corrugated steel armor,
- ❖ Outer jacket is made of medium density polyethylene,
- ❖ Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)





## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
48	4	2	12	2.5	N/A	2.4/1.7*	14.0*	193*

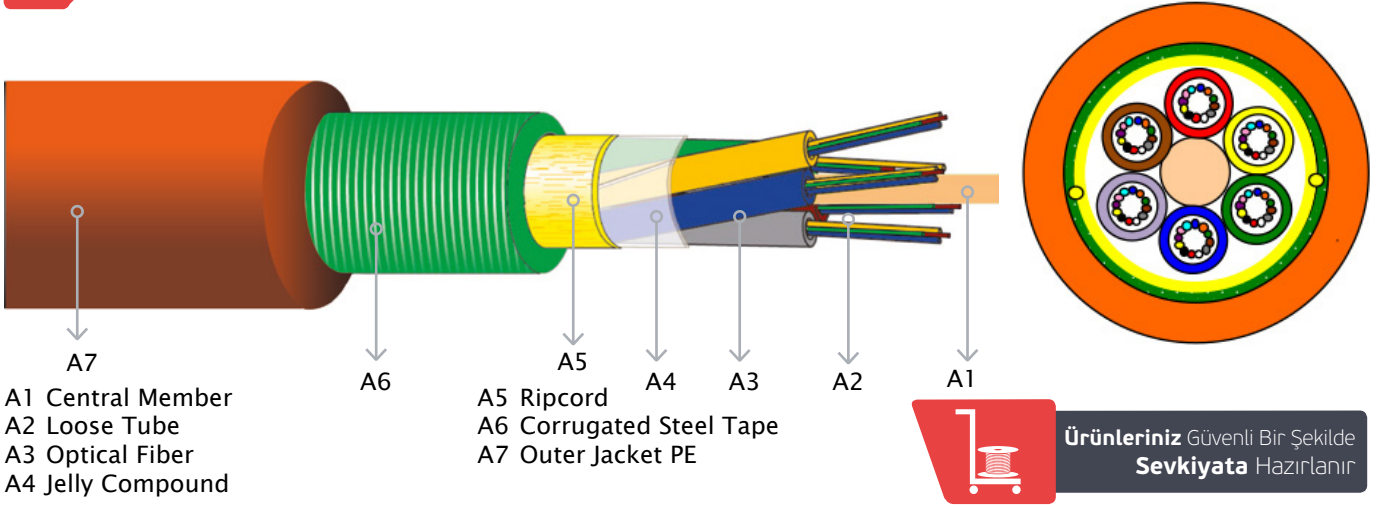
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 72 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-072**  
**Türksat Onay Kodu :**

### Physical Description

- 72 fibers armored outdoor fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
72	6	-	12	2.5	N/A	2.4/1.7*	14.0*	193*

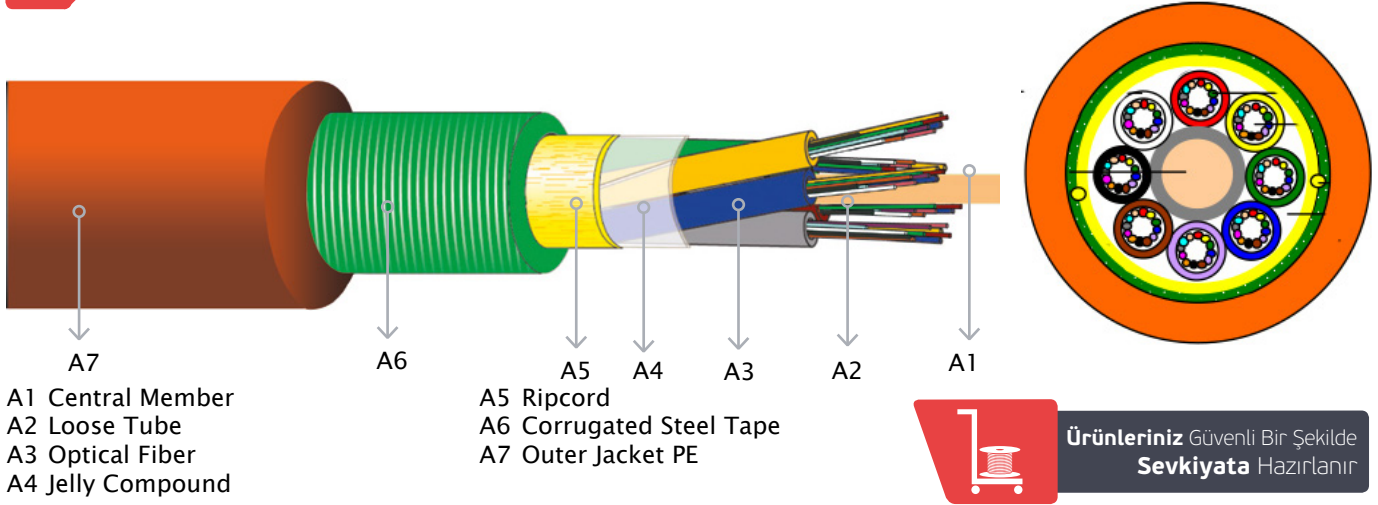
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 96 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-096**  
**Türksat Onay Kodu : TKS-FOM-03**

### Physical Description

- 96 fibers armored outdoor fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



### Physical Specifications

Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
96	8	-	12	2.5	4.2*	2.4/1.7*	15.7*	238*

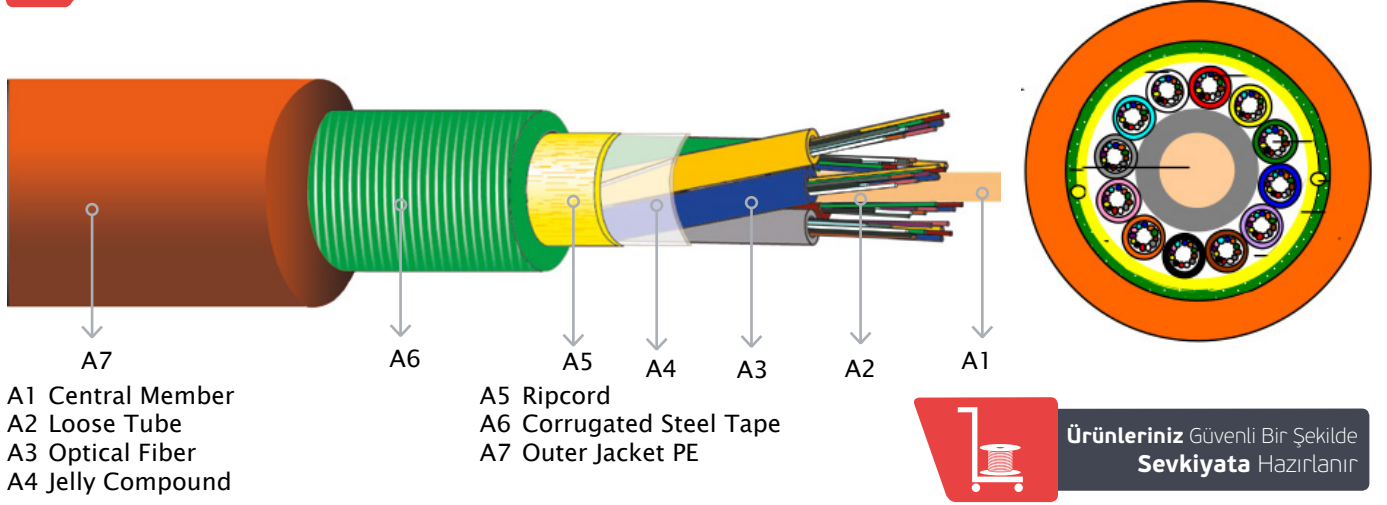
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength (for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm ≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 144 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-144**  
**Türksat Onay Kodu : TKS-FOM-29**

### Physical Description

- 144 fibers armored outdoor fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



### Physical Specifications

Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)





## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
144	12	-	12	2.5	7.5	2.4/1.7*	19.0*	335*

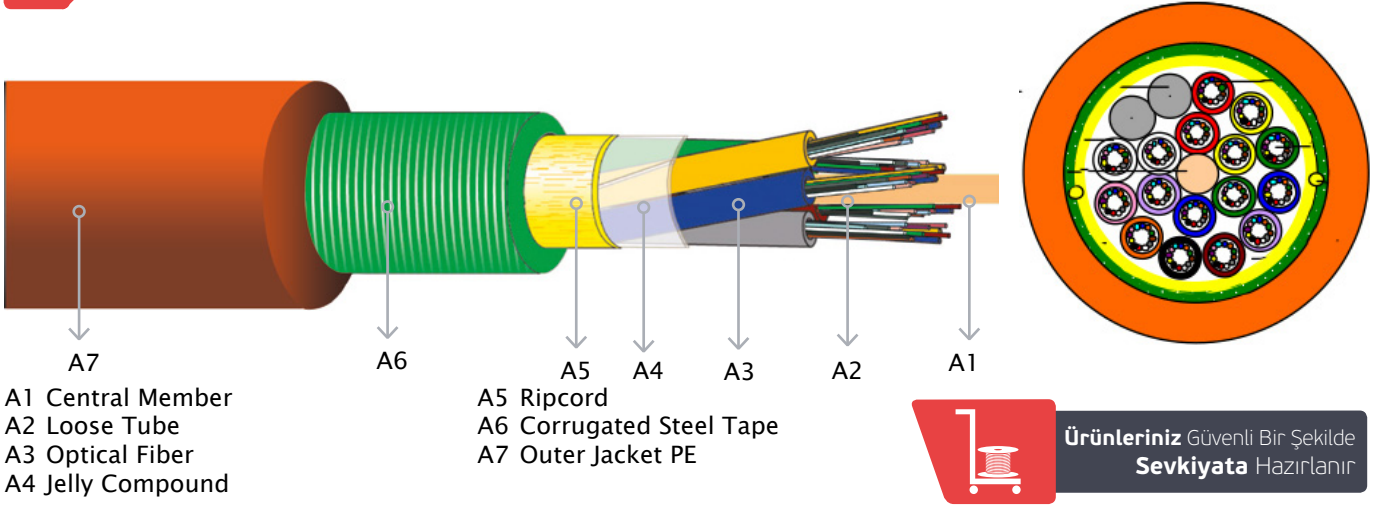
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 216 Core SM MLT SJSA F/O Cable



**Marka/Model : HES/HTS9MSJSA-216**  
**Türksat Onay Kodu : TKS-FOM-04**

### Physical Description

- 216 fibers armored outdoor fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Inner jacket	-
Surface marking	As a customer request
Armor	Corrugated steel tape
Outer jacket	Orange MDPE, thickness nominal 2.2±0.2 mm. (with armor)



# TURKSAT

## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
216	18	-	12	2.5	N/A	2.4/1.7*	18.8*	336*

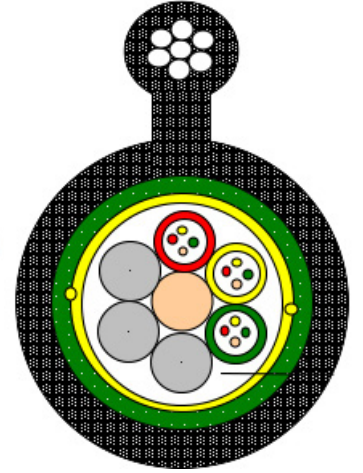
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm ≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 12 Core SM MLT SJSA Fig 8 F/O Cable



A1 Central Member  
A2 Optical Fiber  
A3 Aramid Yarn  
A4 Messenger Wire

A5 Ripcord  
A6 Outer Jacket



Ürünleriniz Güvenli Bir Şekilde  
Sevkiyata Hazırlanır

**Marka/Model : HES/HTS9MSJSAFOH-012**  
**Türksat Onay Kodu : TKS-FOM-05**

### ❖ Physical Description

- 12 fibers armored outdoor aerial figure 8 fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Outer jacket	Black MDPE, minimum thickness 2.0 mm (cable and messenger wire)
Surface marking	As a customer request
Armor	Corrugated steel tape
Messenger Wire	Steel; 7x1.75 mm



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weighth (kg/km)
12	3	3	4	2.2	N/A	2.0/1.4*	13/25.2*	353*

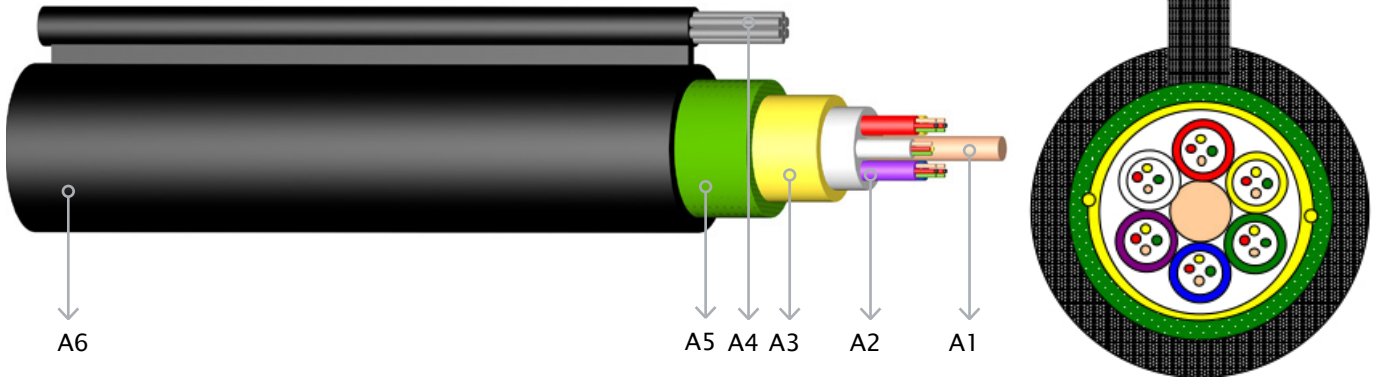
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm ≤ λ ≤ 1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 24 Core SM MLT SJSA Fig 8 F/O Cable



A1 Central Member  
A2 Optical Fiber  
A3 Aramid Yarn  
A4 Messenger Wire

A5 Ripcord  
A6 Outer Jacker



Ürünleriniz Güvenli Bir Şekilde  
Sevkiyata Hazırlanır

**Marka/Model : HES/HTS9MSJSAFOH-024**

**Türksat Onay Kodu : TKS-FOM-06**

### Physical Description

- 24 fibers armored outdoor aerial figure 8 fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



### Physical Specifications

Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Outer jacket	Black MDPE, minimum thickness 2.0 mm (cable and messenger wire)
Surface marking	As a customer request
Armor	Corrugated steel tape
Messenger Wire	Steel; 7x1.75 mm





## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
24	6	-	4	2.2	N/A	2.0/1.4*	13/25.2*	355*

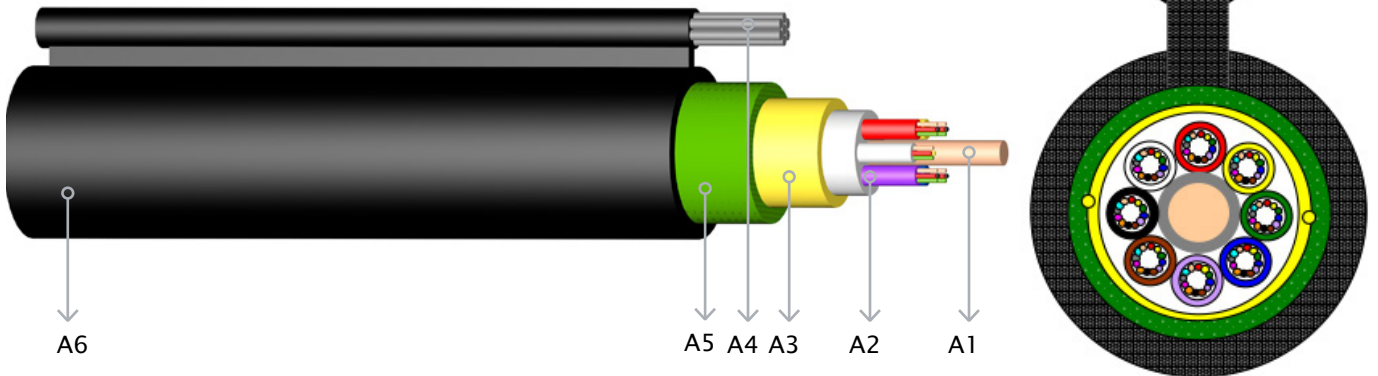
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm ≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 96 Core SM MLT SJSA Fig 8 F/O Cable



A1 Central Member  
A2 Optical Fiber  
A3 Aramid Yarn  
A4 Messenger Wire

A5 Ripcord  
A6 Outer Jacket



Ürünleriniz Güvenli Bir Şekilde  
Sevkiyata Hazırlanır

**Marka/Model : HES/HTS9MSJSAFOH-096**

**Türksat Onay Kodu : TKS-FOM-07**

### Physical Description

- 96 fibers armored outdoor aerial figure 8 fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



Physical Specifications	
Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Outer jacket	Black MDPE, minimum thickness 2.0 mm (cable and messenger wire)
Surface marking	As a customer request
Armor	Corrugated steel tape
Messenger Wire	Steel; 7x1.75 mm



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
96	8	-	12	2.5	N/A	2.4/1.7*	15.8/28*	425*

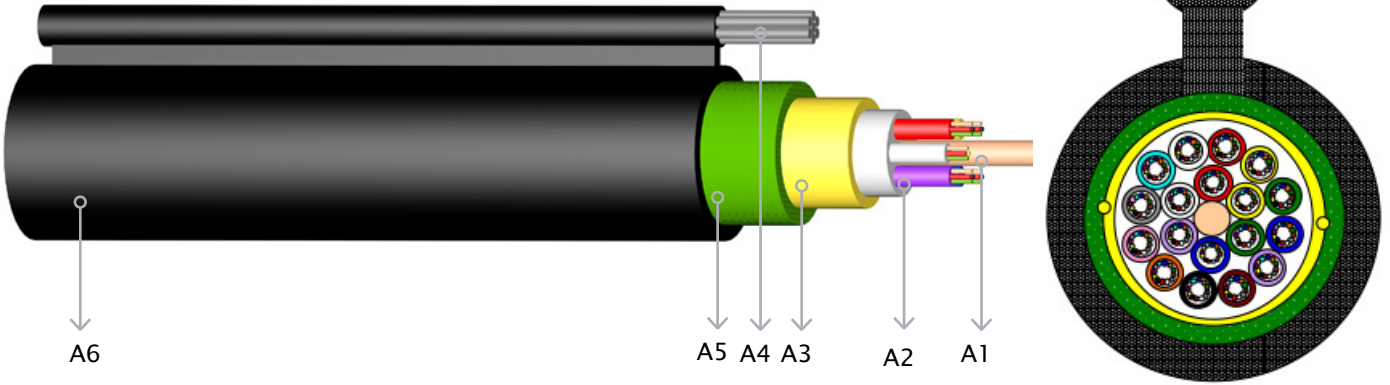
## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength (for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm ≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

## 216 Core SM MLT SJSA Fig 8 F/O Cable



A1 Central Member  
A2 Optical Fiber  
A3 Aramid Yarn  
A4 Messenger Wire

A5 Ripcord  
A6 Outer Jacker



Ürünleriniz Güvenli Bir Şekilde  
Sevkiyata Hazırlanır

**Marka/Model : HES/HTS9MSJSAFOH-216**

**Türksat Onay Kodu : TKS-FOM-08**

### Physical Description

- 216 fibers armored outdoor aerial figure 8 fiber optic cable,
- Thixotropic jelly filled loose tubes,
- Loose tubes and filler (if any) are SZ stranded around the non-metallic central strength member (FRP),
- Jelly filled core,
- Aramid yarn as strength elements,
- Corrugated steel armor,
- Outer jacket is made of medium density polyethylene,
- Ripcord is inserted for easy jackets removal.



### Physical Specifications

Fiber Type	SM G652 D
Central strength member	All-dielectric FRP
Tube material	PBT ( Polybutylene Terephthalate)
Color of loose tubes	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Color of fibers in per tube	Red, Yellow, Green , Blue, Violet, Brown, Black, Orange, Pink, Gray, Aqua, Natural
Tube filling compound	Thixotropic jelly
Core filling compound	Jelly
Tape wrap	-
Strength elements	Aramid yarns
Ripcord	Aramid cord
Identification tape marking	As a customer request
Outer jacket	Black MDPE, minimum thickness 2.0 mm (cable and messenger wire)
Surface marking	As a customer request
Armor	Corrugated steel tape
Messenger Wire	Steel; 7x1.75 mm



## SPECIFICATIONS

Fiber Count	Number of Tube	Number of Filler	Number of fiber in per tube	Central Strength Member OD (mm)	Central strength member coated OD (mm)	Tube Outer/Inner Diameter (mm)	Cable Diameter (mm)	Cable Weight (kg/km)
216	18	-	12	2.5	N/A	2.4/1.7*	18.8/31.2*	525*

## Mechanical and Environmental Properties

Physical tests	Conditions	Requirement	Standard
Tensile Strength ( for 24-48 fibers)	2700 N (during Installation) 900 N (during Operation)	Maximum fiber strain: %0.33	IEC 60794-1-E1
Impact Resistance	30Nm , 3 impacts , 300mm	No fiber break	IEC 60794-1-E1
Crush Resistance	4000 N/10cm	No fiber break	IEC 60794-1-E3
Temperature Cycling	-40 to +70 °C	Maximum loss:0.05 dB	IEC 60794-1-F1
Bend Radius (during installation)	20x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Bend Radius (during Service)	10x cable diameter	Maximum loss:0.05 dB	IEC 60794-1-E11
Repeating Bending	20xcable diameter between	Maximum loss:0.05 dB	IEC 60794-1-E6
Water Penetration	1 m length in 24 hour	No water leak	IEC 60794-1-F5
Operation Temperature	-40 to +70 °C		
Storage and Transportation Temperature	-40 to +70 °C		
Installation Temperature	-20 to +60 °C		

## STANDARD SM FIBER ITU-T G 652 D

FPROPERTIES	SPECIFIED VALUES
Attenuation (max.)	0.36 dB/km (1310 nm) 0.22 dB/km (1550 nm)
MFD	9.2±0.4 µm(1310 nm) 10.3±0.5 µm(1550 nm)
Chromatic Dispersion (max)	3.5 ps/(nmxkm) (1310 nm ) 17 ps/(nmxkm) (1550 nm )
Cladding diameter	125±0.3µm
Core Concentricity error (max)	0.6 µm
Zero dispersion wavelength	1300nm≤ ≤1324nm
Cladding non-circularity (max)	%1
Coating diameter	250±10 µm
Cut Off Wavelength	≤1260nm
Proof Test	8.4 N
Proof Test strain	%1.00

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