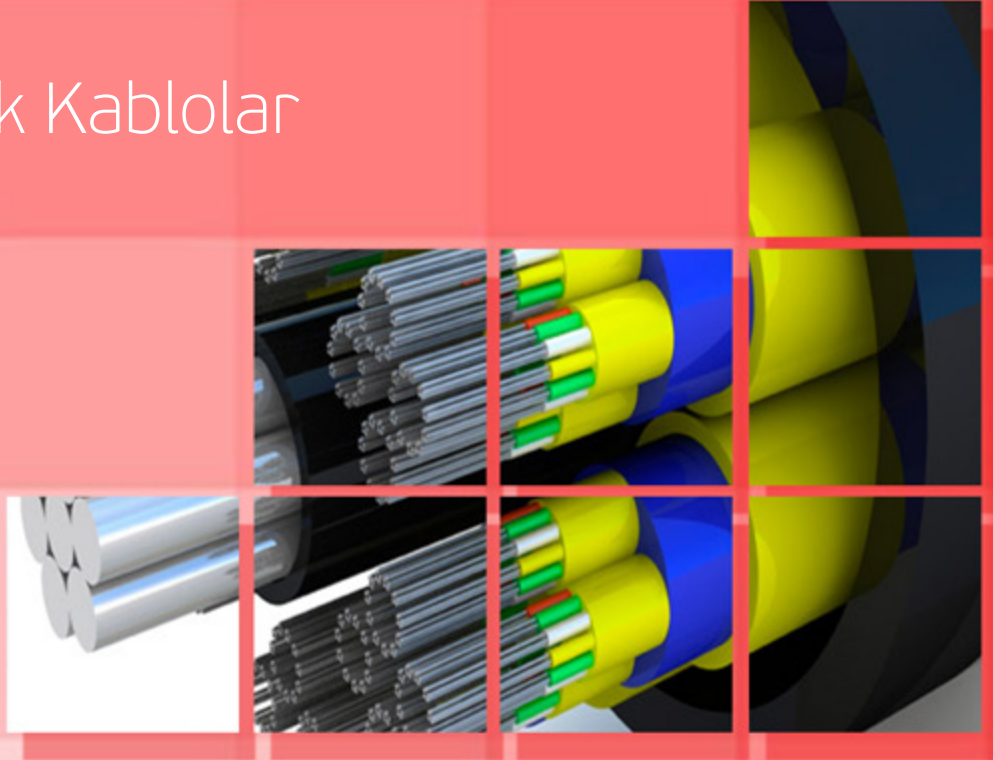




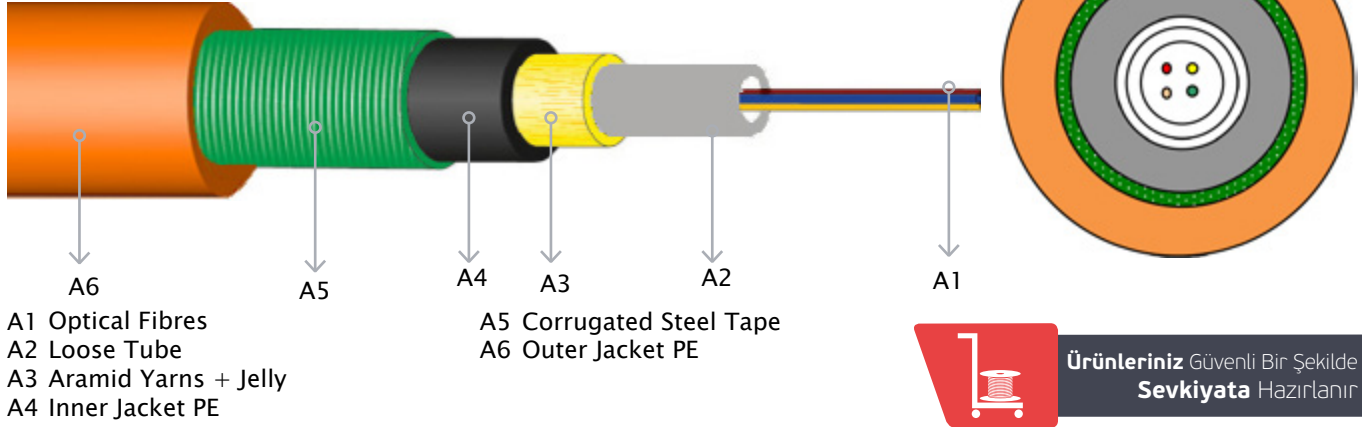
Data Sheet

Fiber Optik Kablolar



0.(352) 322 27 70
www.erattelekom.com.tr

4 Core SM SLT DJSA F/O Cable



A1 Optical Fibres

A2 Loose Tube

A3 Aramid Yarns + Jelly

A4 Inner Jacket PE

A5 Corrugated Steel Tape

A6 Outer Jacket PE

Ürünleriniz Güvenli Bir Şekilde
Sevkiyata Hazırlanır

Marka/Model : HES/HTS9SDJSA-004

Türksat Onay Kodu : TKS-FOM-3523022016005

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

| 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 |



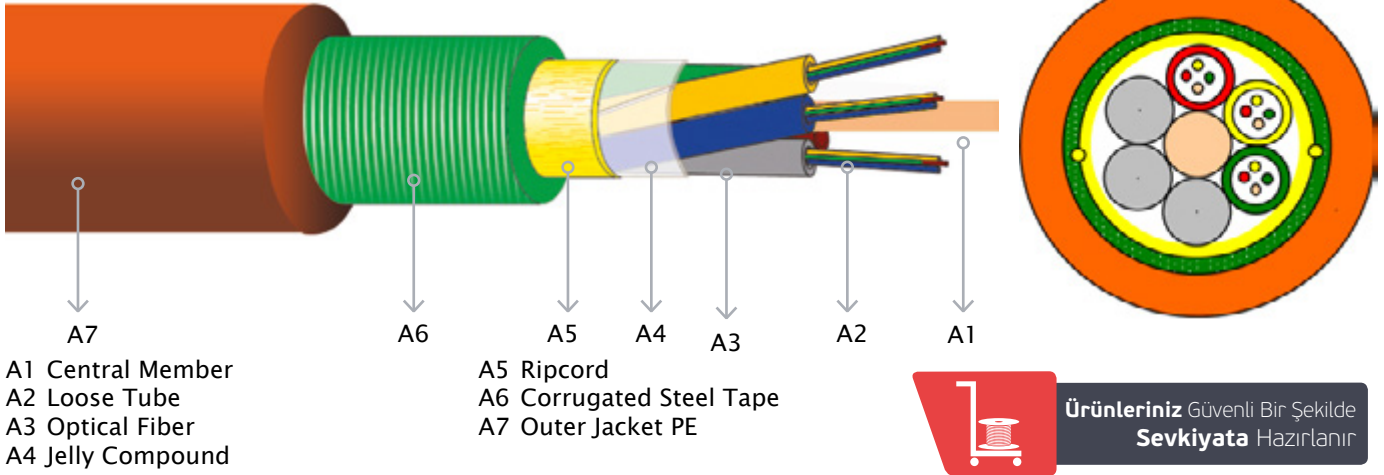
| SPECIFICATIONS | | | |
|----------------|--------------------------------|---------------------|----------------------|
| Fiber Count | Tube Outer/Inner Diameter (mm) | Cable Diameter (mm) | Cable Weight (kg/km) |
| 4 | 3.0±0.1/2.0±0.1 | 11.8* | 135* |

*: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-0118042014005

❖ 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* |

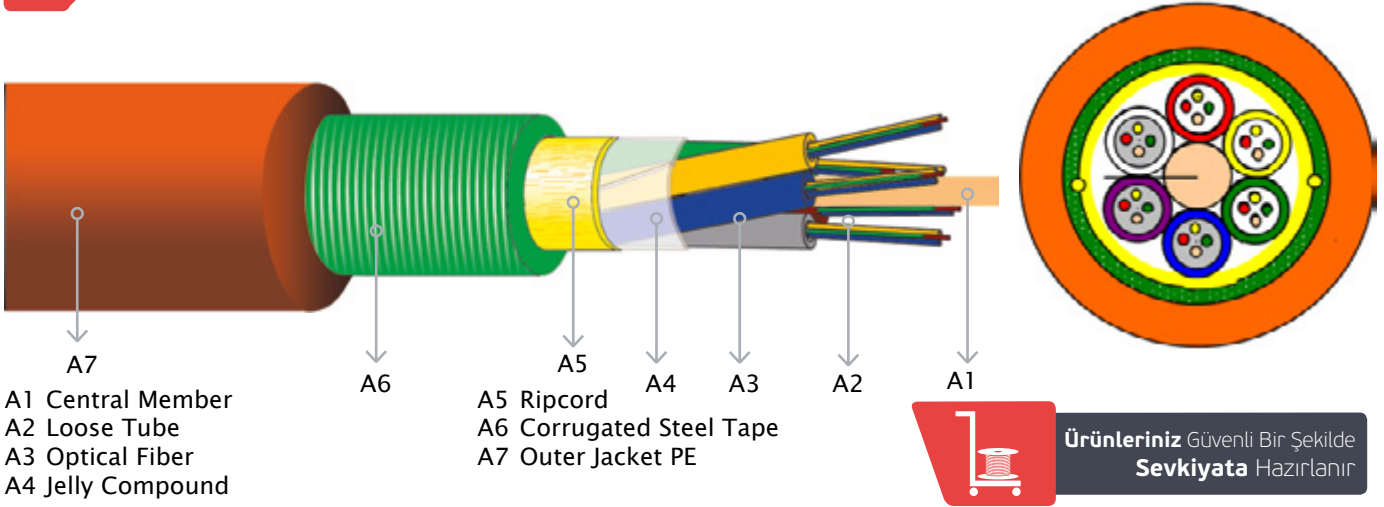
Mechanical and Environmental Properties

| 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-0218042014005

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

| 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* |

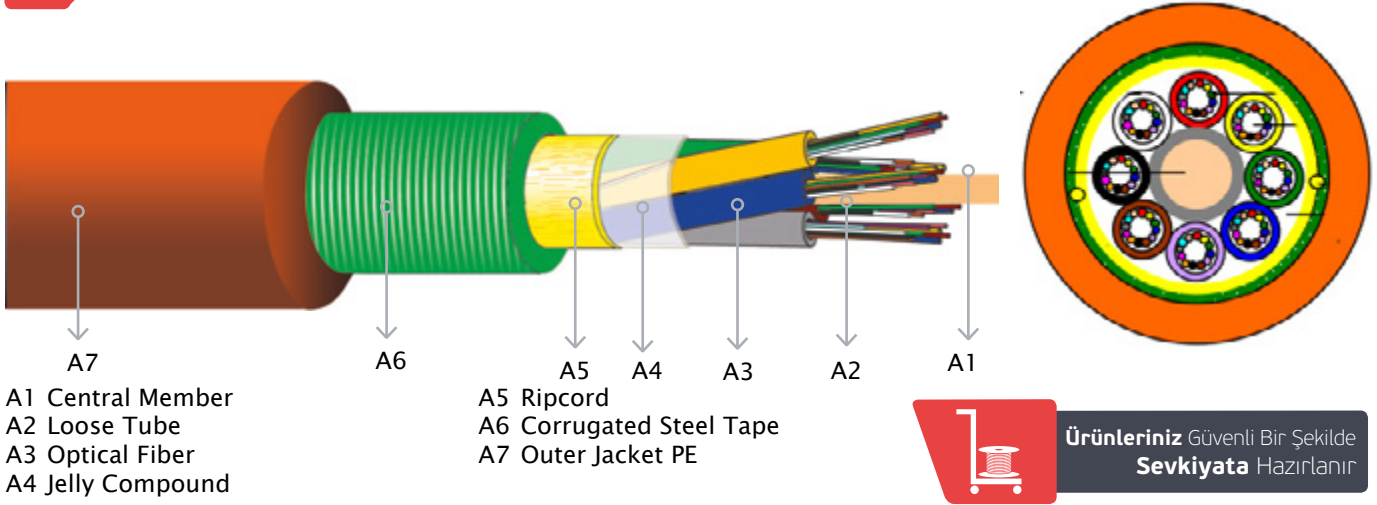
Mechanical and Environmental Properties

| 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 |

96 Core SM MLT SJSA F/O Cable



Marka/Model : HES/HTS9MSJSA-096

Türksat Onay Kodu : TKS-FOM-0318042014005

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* |

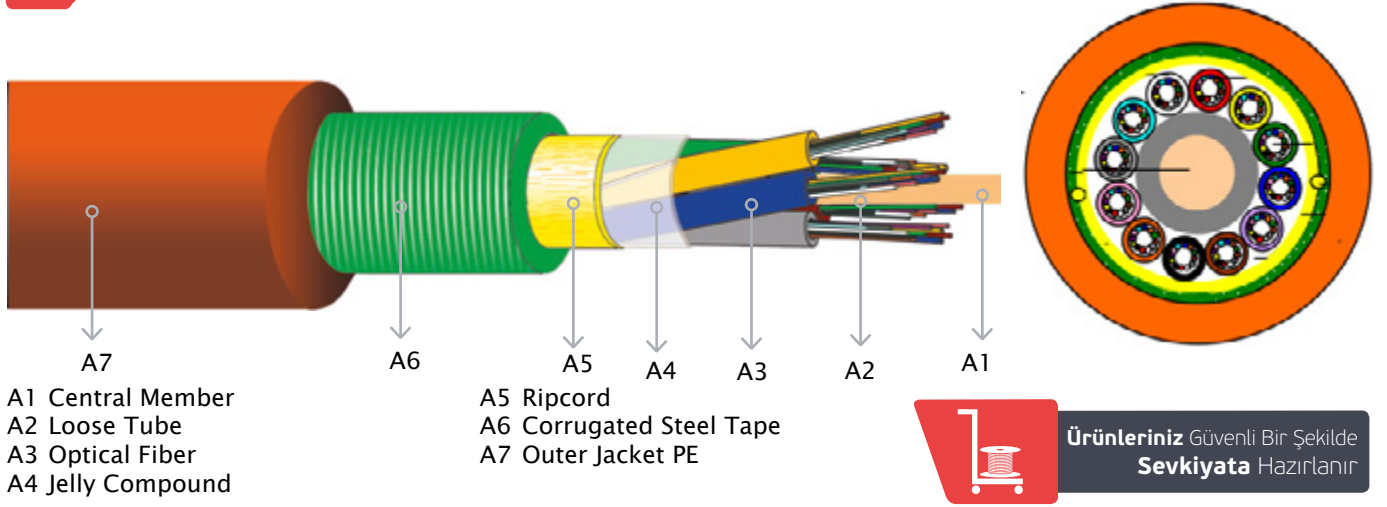
Mechanical and Environmental Properties

| 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 ≤ 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 |

144 Core SM MLT SJSA F/O Cable



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

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* |

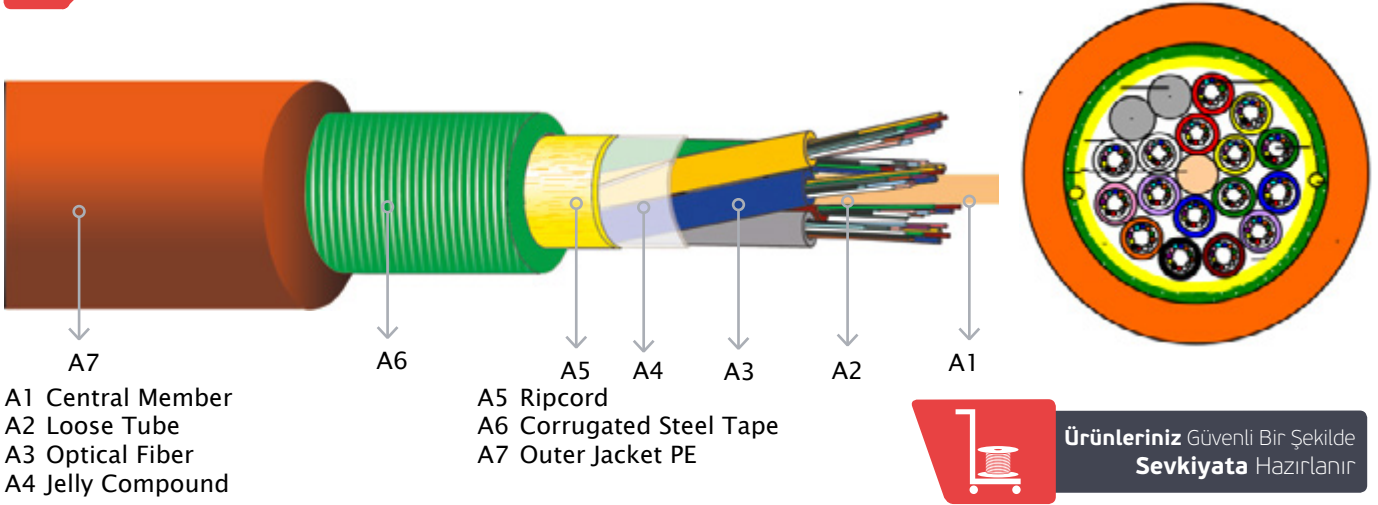
Mechanical and Environmental Properties

| 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-0418042014005

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* |

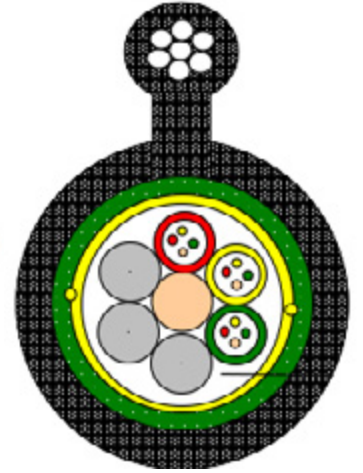
Mechanical and Environmental Properties

| 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-0518042014005

❖ 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* |

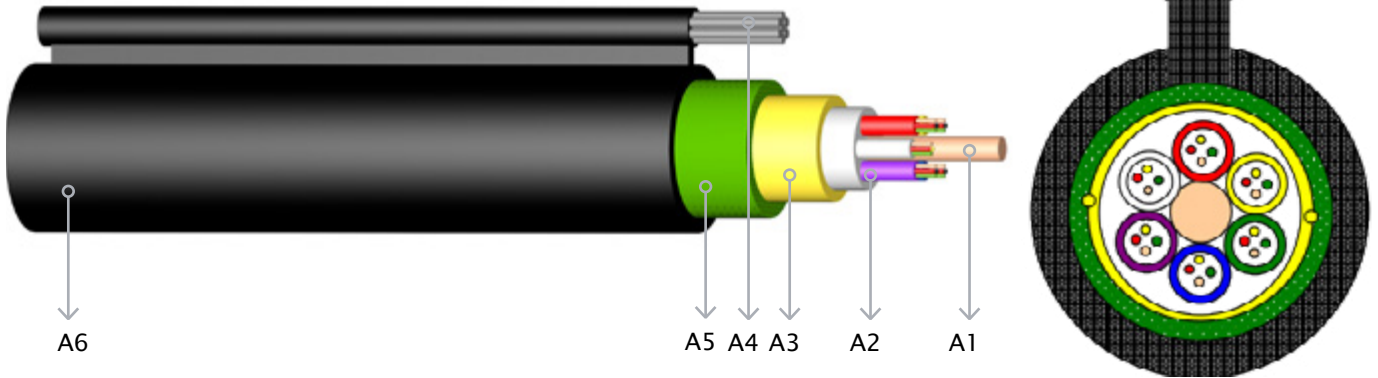
Mechanical and Environmental Properties

| 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-0618042014005

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* |

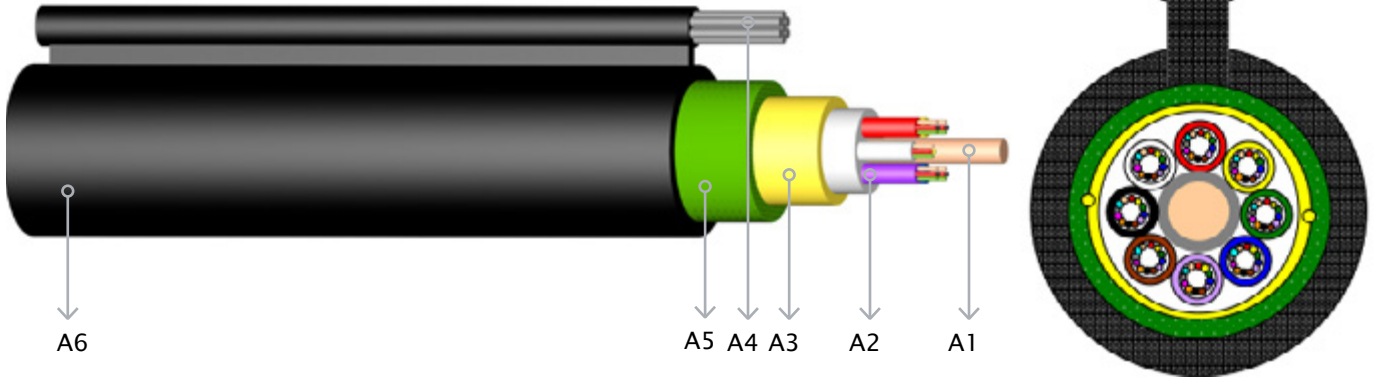
Mechanical and Environmental Properties

| 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 Jacker



Ürünleriniz Güvenli Bir Şekilde
Sevkiyata Hazırlanır

Marka/Model : HES/HTS9MSJSAFOH-096

Türksat Onay Kodu : TKS-FOM-0718042014005

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

| 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* |

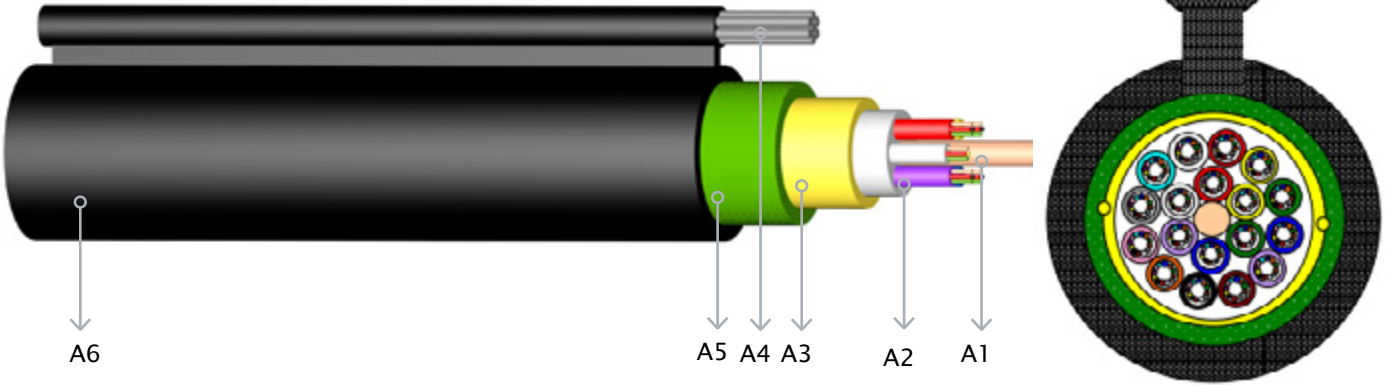
Mechanical and Environmental Properties

| 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-0818042014005

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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