DATE Apr. 15, 2021

NO. JFS-00189A

Supersedes JFS-00189

Messrs.

SPECIFICATION
FOR
SINGLE-MODE OPTICAL FIBER
(FutureGuide®-SR15E)

Prepared by A. AIZAWA

Optical Fiber Business Planning Department
Optical Fiber Division
Power & Telecommunication Systems Company

Approved by N. Watanabe
Senior Manager
Optical Fiber Business Planning Department
Optical Fiber Division
Power & Telecommunication Systems Company

Fujikura

FUJIKURA'S SPECIFICATION FOR SINGLE-MODE OPTICAL FIBER (Fujikura Designation: FutureGuide®-SR15E)

1. General

This specification covers a single-mode optical fiber optimized at a wavelength of 1310nm and 1550nm region, but also can be used in the wavelength of 1380nm region, complying with the latest ITU-T recommendation G.657.A1 and G.652.D. Unless otherwise stated, the characteristics below are measured at ambient temperature (23 ± 5°C), following the latest IEC standards.

2. Structural specifications

Typical fiber structure is shown in Fig. 1.

No.	Item	Specified value	Reference standard
2.1	Fiber materials		
2.1.1	Core material	Silica (SiO_2) doped with germanium dioxide (GeO_2)	
2.1.2	Cladding material	Pure silica (SiO_2)	
2.1.3	Coating material	Dual layers of UV-cured acrylate (Uncolored)	
2.2	Dimensions		
2.2.1	Mode field diameter	8.6 ± 0.4 μm at 1310 nm	IEC60793-1-45
2.2.2	Cladding diameter	125.0 ± 0.7 μm	IEC60793-1-20
2.2.3	Coating diameter (uncolored)	240 ± 5 μm	IEC60793-1-21
2.2.4	Core concentricity error	≤ 0.5 μm	IEC60793-1-20
2.2.5	Cladding non-circularity	≤ 1.0 %	IEC60793-1-20
2.2.6	Coating-Cladding concentricity error	≤ 12 μm	IEC60793-1-21
2.3	Fiber curl radius	≥ 4.0 m	IEC60793-1-34
2.4	Coloring	Not applicable	

3. Optical specifications

No.	Item	Specified value	Reference standard
3.1	Attenuation		
3.1.1	Attenuation coefficient at 1310nm at 1383nm*1 at 1550nm at 1625nm	 ≤ 0.35 dB/km ≤ 0.31 dB/km ≤ 0.21 dB/km ≤ 0.23 dB/km	IEC60793-1-40
3.1.2	Attenuation vs. wavelength *2 1285 - 1330nm, ref. λ of 1310nm 1525 - 1575nm, ref. λ of 1550nm	 $\alpha \leq 0.05$ dB/km $\alpha \leq 0.05$ dB/km	IEC60793-1-40
3.1.3	Macrobending *3 ϕ=30mm, 10 turns at 1550nm ϕ=30mm, 10 turns at 1625nm ϕ=20mm, 1 turn at 1550nm ϕ=20mm, 1 turn at 1625nm	 ≤ 0.25 dB ≤ 1.0 dB ≤ 0.75 dB ≤ 1.5 dB	IEC60793-1-47
3.1.4	Point discontinuity	No point discontinuity greater than 0.05 dB at either 1310 nm or 1550 nm in the OTDR trace.	IEC60793-1-40
3.2	Cable cut-off wavelength λ_{cc}	$\lambda_{cc} \leq 1260$ nm	IEC60793-1-44
3.3	Chromatic dispersion		
3.3.1	Chromatic dispersion coefficient at 1285 - 1330nm at 1550nm (D_{1550}) at 1625nm (D_{1625})	 ≤ 3.5 ps/(nm·km) $13.3 \leq D_{1550} \leq 18$ ps/(nm·km) $17.2 \leq D_{1625} \leq 22$ ps/(nm·km)	IEC60793-1-42
3.3.2	Zero-dispersion wavelength λ_0	1300 nm ≤ λ_0 ≤ 1324 nm	
3.3.3	Zero-dispersion slope S_0	$0.073 \leq S_0 \leq 0.092$ ps/(nm^2·km)	
3.4	Polarization mode dispersion (uncabled fiber) *4	≤ 0.20 ps/√km	IEC60793-1-48

Notes:

*1. The value after hydrogen aging in accordance with IEC 60793-2-50.

*2. The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (λ) by more than the value α.

*3. The induced attenuation due to fiber wrapped around a mandrel of a specified diameter (ϕ).

*4. This characteristic is guaranteed under the free tension condition only.

4. Mechanical specifications

No.	Item	Specified Value	Reference Standard
4.1	Proof test*	≥ 1.5% (150kpsi or 1.0GPa)	IEC60793-1-30
4.2	Dynamic stress corrosion susceptibility parameter (n_d)	≥ 20	IEC60793-1-33
4.3	Coating strippability F	$1.3N \leq F \leq 8.9N$	IEC60793-1-32

Note:

* The entire optical fiber length is tested with regard to the tensile strength.

5. Environmental specifications

No.	Item	Specified value	Reference standard
5.1	Environmental specifications	Induced attenuation at 1310nm, 1550nm and 1625nm	
5.1.1	Temperature dependence * -60 to 85°C	≤ 0.05 dB/km	IEC60793-1-52
5.1.2	Water immersion at 23 ± 2°C	≤ 0.05 dB/km	IEC60793-1-53
5.1.3	Dry heat * at 85 ± 2°C	≤ 0.05 dB/km	IEC60793-1-51
5.1.4	Damp Heat * 85°C at 85%R.H.	≤ 0.05 dB/km	IEC60793-1-50

Note:
* Reference temperature =23°C.

6. Typical Values

No.	Item	Typical value	Remark
6.1	Refractive index profile	Matched clad, step index profile	
6.2	Effective group index of refraction N_{eff} at 1310nm at 1550nm	 1.4680 1.4686	

Note: These characteristics are typical values, therefore Fujikura do not guarantee.

7. Packing

The available reel lengths are as follows.

Length(km)	8.4	12.6	16.8	21.0	25.2	29.4
	33.6	37.8	42.0	46.2	50.4	

The reel size is standardized by Fujikura Ltd. as shown in Fig. 3 and Fig. 4.
A Fujikura label(s) with the manufacture's name, the production No., the type of fiber and the fiber length are shown on each reel.
Other lengths are also available upon request.

8. Measurement data

If so requested by the customer, fiber data are transmitted electronically and precede each shipment.

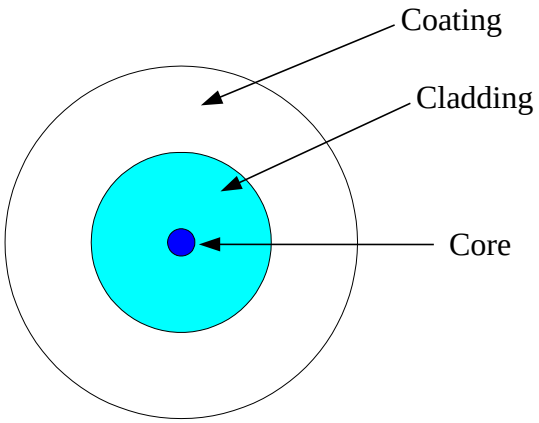

Fig.1 Structure of FutureGuide®-SR15E

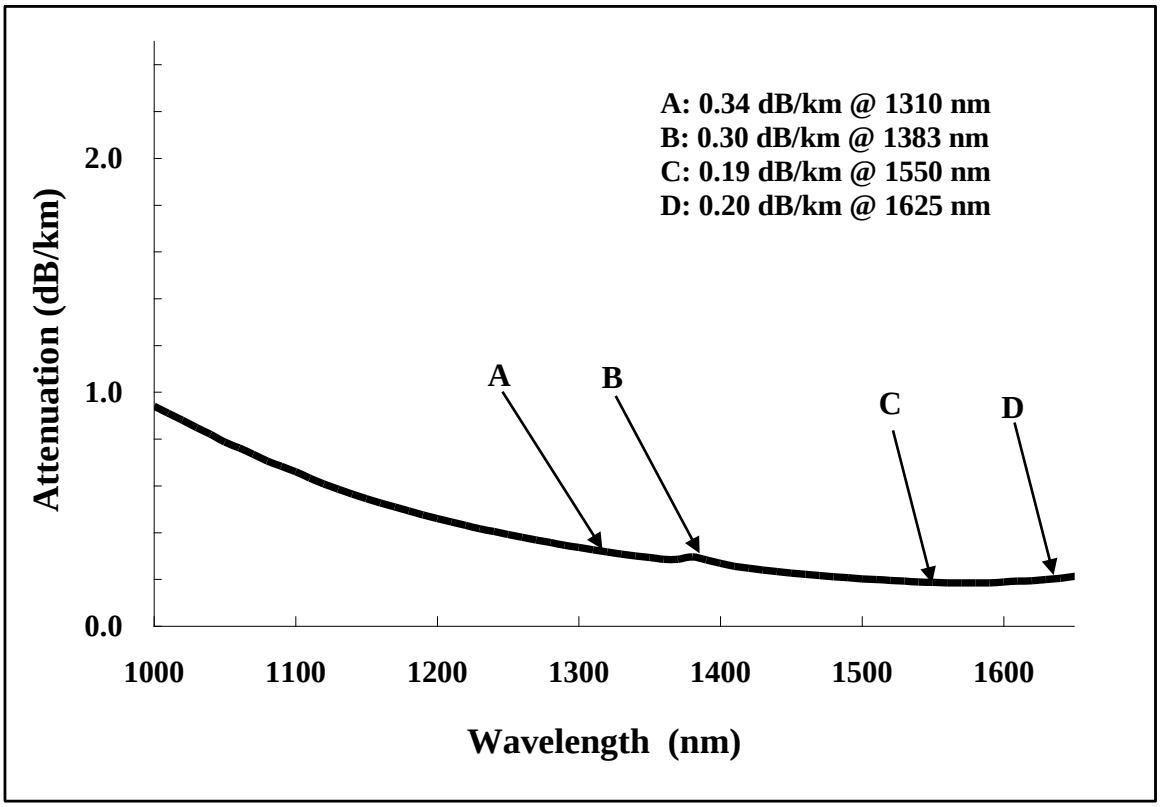

Fig.2 Spectral attenuation (Typical fiber)

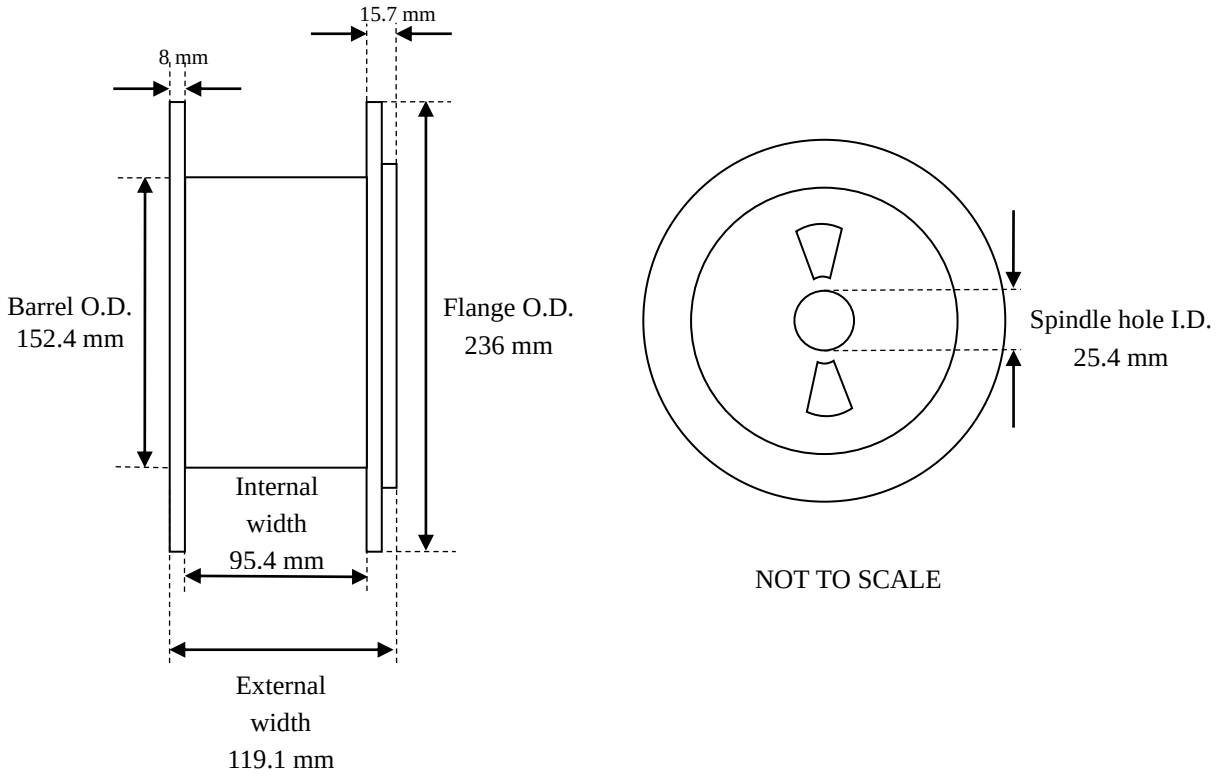

Fig. 3 Fiber reel (for up to 25.2 km)

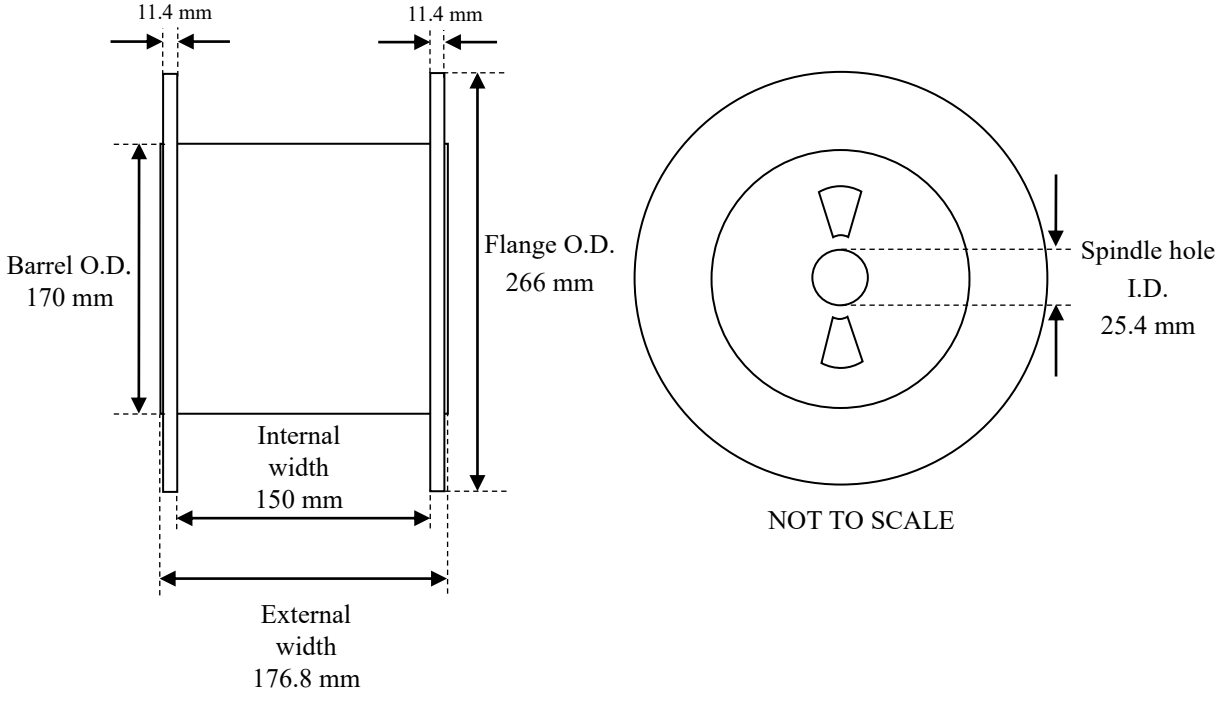

Fig. 4 Fiber reel (for up to 50.4 km)

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