

# Specifications for Plastic Optical Fiber

## SHCN-1000-15(02)

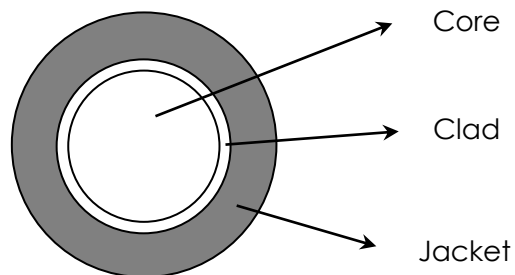
### Rev. A

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Issued by : Asahi Kasei Corporation  
Plastic Optical Fiber  
Marketing & Development Gr

1, STRUCTURE

ITEM	UNIT	Specifications
Core Material		PMMA
Core Diameter	μm	980 ± 45
Clad Material		Fluorinated Polymer
Clad Thickness	μm	> 8
Fiber Diameter	μm	1000 ± 45
Jacket Material		PA12 black (only pre-compounded material allowed)
Jacket Diameter	μm	1520 ± 20
Jacket Color		Black due to carbon
Jacket Carbon Content	%	0.294 ± 0.015
Concentricity to Fiber	mm	< 0.045
NA		0.6



2, PROPERTIES

ITEM	UNIT	Specifications	
Attenuation	dB/km	< 250	*1
Stripping Force	N	> 50	*2
Tensile Force	N	> 60	*3
Bending Stiffness	N	4 ~ 7	*4
Long Term Bending Radius	mm	> 10	*5
Short Term Bending Radius	mm	> 7.5	*6
Short Term Bending Radius Reversible	mm	> 7.5	*7
Bending Radius Over Lifetime	mm	> 25	*8
Shrinkage	%	≤ 0.25	*9
Pistoning	mm	± 0.03	*10
Drop Impact	dB	≤ 0.2	*11
Pulling Strength	dB	≤ 0.3	*12
Application Temperature Range	°C	-40 ~ +105	*13
Short Time Period	°C	+110	*14
		+115	*15
		+120	*16

Sample conditions

Temperature: T = 23°C  
Humidity: RH = 50%  
Storage time: t = 200h

\*1 : 20-2m Cut Back,  $\lambda = 650\text{nm}$  at full stimulation

\*2 : Stripping Length = 30mm, Stripping Speed = 100mm/min

\*3 : At Elongation = 2.5%

Distance between chucks = 0.5m, Draw Speed = 100mm/min

\*4 : Following DIN EN ISO 178

L = 100mm, Gap Length = 15mm, Pushing Speed = 5mm/min

\*5 : L = 3m, 2x360° bending, 85°C85%RH, 6000h, delta dB < 1.0

\*6 : L = 3m, 2x360° bending, 85°C85%RH, 24h, delta dB < 1.0

\*7 : L = 3m, 2x360° bending, 23°C, 24h, delta dB < 0.3

\*8 : L = 3m, 1x360° bending, Fiber ends should be outside oven,  
-40~+105°C, 500h, delta dB < 0.5

\*9 : L = 1m, 120°C, 3min.

\*10 : L = 0.5m, 105°C, 24h

\*11 : Initial Energy  $E_s = 0.1\text{Nm}$ , Falling Height = 200mm

Weight of Hammer = 510g, Hammer Radius = 300mm

\*12 : T = RT, L = 3m, Stressed Length = 500mm, Initial Pulling Force = 1N

Pulling Speed = 20mm/min, Stretching Rate = 3%, Duration = 96h

\*13 : L = 0.2m, 105°C, 2000h, delta dB < 0.5

\*14 : L = 1m, 110°C, 3min, delta dB ≤ 0.10

\*15 : L = 1m, 115°C, 5min, delta dB ≤ 0.15

\*16 : L = 1m, 120°C, 3min, delta dB ≤ 0.25

\*14, \*15\*, 16 : (This value is subjected to be measured by JIS C6823:2010 method)

### 3, RoHS certification

The product does not contain RoHS 2 hazardous substances, Cadmium, Lead, Mercury, Chromium (VI), PBB, PBDE, DIBP, DEHP, DBP and BBP intentionally.

## **Precautions in Handling and Use**

### **Restricted applications**

DO NOT USE Plastic Optical Fiber FOR ANY APPLICATION WHICH IS INTENDED TO COME INTO DIRECT CONTACT WITH THE HUMAN BODY OR DIRECT CONTACT WITH FOOD. Consult Asahi KASEI before considering Plastic Optical Fiber for any non-invasive medical device applications; invasive applications cannot be considered.

### **Installation and operating environment**

Plastic Optical Fiber is not structurally or materially designed to bear large external loads. Do not place or drop heavy objects on Plastic Optical Fiber, or hang objects from Plastic Optical Fiber. Improper installation or service environment may seriously degrade its light transmission capability. The design of any system or instrument in which Plastic Optical Fiber is to play an essential role must provide effective control of its installation and operating environment (temperature, humidity, freedom from exposure to solvents, chemicals, ultraviolet light, etc.) and appropriate back-up in case of light transmission loss.

Laboratory tests and experience have shown all of the following to require particular care, in both installation and service.

- \* Do not squeeze, pinch, or compress Plastic Optical Fiber with tools, fixtures, or securing devices.
- \* Do not bring into direct contact with any chemicals that might degrade the Plastic Optical Fiber.
- \* Do not bring into direct contact with any tubes, cables, or other rubber or plastic objects containing plasticizer (DOP, etc.), stabilizer, or other additive that might migrate into the Plastic Optical Fiber and cause discoloration or reduced photoconductivity.
- \* Do not apply or permit contact with any adhesive containing a solvent, monomer, or other component that might adversely affect the physical or optical properties of Plastic Optical Fiber.
- \* Do not use any alcohol or organic solvent in cleaning or wiping Plastic Optical Fiber, as it may cause cracking or hazing.
- \* Do not expose Plastic Optical Fiber to ultraviolet or radioactive rays, which may cause deterioration and loss of photoconductivity.

### **Heat exposure**

Plastic Optical Fiber softens at approximately 100°C, decomposes and emits flammable gas at approximately 200°C, and above 200°C may ignite and burn. Any lamp or other light source assembly must include a cooling device to keep Plastic Optical Fiber below 80°C, and particularly in conjunction with the use of a condenser lens, the end surface of Plastic Optical Fiber must be kept free of dirt and other contaminants, which may cause elevated Plastic Optical Fiber surface temperature, decomposition, and fire.

### **Storage**

Store Plastic Optical Fiber indoors, in a place free from direct sunlight, water and excessive humidity, to protect its properties and performance.

### **Disposal**

Plastic Optical Fiber contains fluorine and vinyl chloride resins, and will emit hydrogen fluoride, hydrogen chloride or other toxic gases during incineration. Dispose of Plastic Optical Fiber either by land-fill burial or by incineration in a facility capable of removing and disposing of such gases, in strict accordance with national and local laws and regulations.

- ◆ The information is accurate to the best knowledge of Asahi Kasei as of the date of its publication, and may be changed when new knowledge or information is acquired.