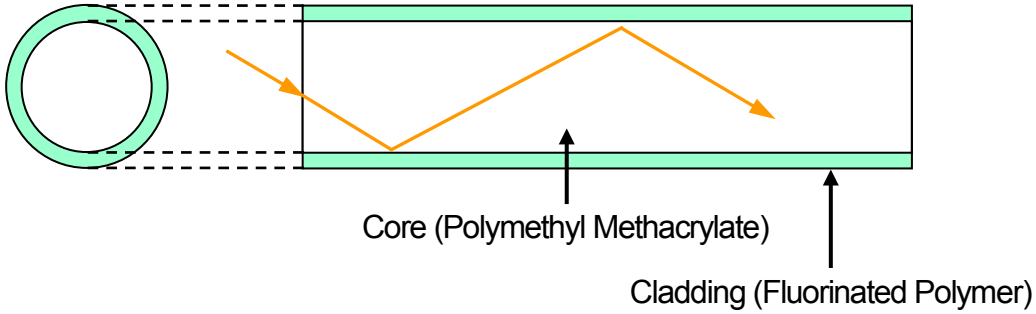
Toray polymer optical fibers have been developed by Toray Industries, Inc., based on its experience in polymer and fiber manufacturing as a leading producer of synthetic fibers and plastic products in the world.
Our optical fiber is step index type with core of high-purity polymethyl methacrylate and cladding of special fluorinated polymer.
We have four types of optical fiber, of which brief descriptions are given in the following table. Our optical fiber and its fabricated products are divided into three grades according to the attenuation.



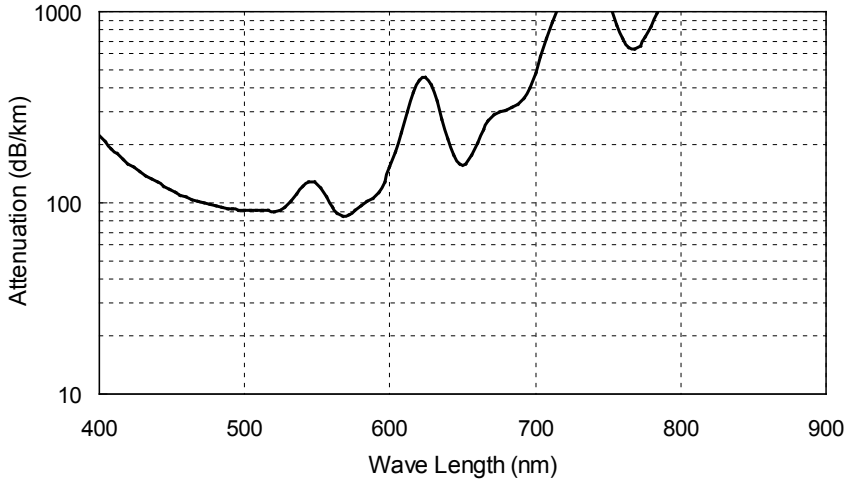
Structure of Toray Optical Fiber and Diagram of Light Transmission

● Fiber Series

Series		PG	PK	PS	PF	PFE	PE
Material	Core	Polymethyl Methacrylate (PMMA)					
	Cladding	Fluorinated Polymer					
Refractive index profile		Step Index					
Numerical aperture		0.50	0.50	0.46	0.46	0.50	0.58
Acceptance angle		60°	60°	55°	55°	60°	71°
Available temperature range Permanent use		−55～70℃	−55～70℃	−55～70℃	−55～85℃	−55～85℃	−55～105℃
Main Usages		- Communication (Audio) - Optical Sensors - Lighting		- Lighting by Side Emission	- Communication (FA)	- Communication (FA,Automotive)	

※Values in the table are for reference, and can vary based on the conditions and environment of use.

● Spectral Attenuation of Optical Fiber (Typical Data)



● Handling Precautions

Ⅰ. Products

Please follow the guidelines stated below when handling Toray Raytela® Plastic Optical Fiber fibers, cord, cables and other processed items.
(hereinafter referred to as Raytela® Optical Fiber)

Ⅱ. Safety Precautions

1. Usage Precautions

（1） Raytela® Optical Fiber shall under no circumstance come into direct contact with food, nor shall it be used inside the human body

2. Design Precautions

（1） When designing a system using Raytela® Optical Fiber, be sure to fully review the Raytela® Optical Fiber characteristics, as described in the technical manuals before usage.

（2） The characteristics shown in the technical manuals do not guarantee the safety and adaptability of the product. Please confirm the safety and adaptability of the products according to the intend use of the products.

3. Usage

（1） Do not use the fiber under extreme temperatures. Refer to the individual Raytela® Optical Fiber technical specification sheets, for operational temperature requirements. If the temperature exceeds 200℃, there is a danger of gas emitting and/or ignition from the decomposition of the fiber.

（2） When a halogen lamp or condensed sunbeams are used as a light source, a heat cut filter or cooling device needs to be used to prevent the temperature from rising past the limit of the fiber.

（3） Avoid usage in dusty, dirty places. If dust and/or dirt adheres to the terminals of Raytela® Optical Fiber, the optical characteristics of the fiber may deteriorate. Furthermore, Raytela® Optical Fiber may melt and/or burn by igniting dust under high temperature conditions.

4. Disposal Precautions

（1） Raytela® Optical Fiber contains fluorocarbon resin. Some products are also sheathed in vinyl chloride resin. When incinerated, such products may generate corrosive and poisonous hydrogen fluoride gas or hydrogen chloride gas. When disposing, incinerate in an acid-resistant incinerator equipped with a toxic substance remover/filter, or commission an industrial waste treatment specialist to bury them.

（2） It is necessary to observe the laws and regulations of the country or providence where the fiber is to be incinerated or buried for disposal.

Ⅲ. How to get the most performance out of Raytela® Optical Fiber

1. Precautions against physical environmental factors

（1） Do not apply force that exceeds the maximum allowable tension factor.

（2） Do not bend the fiber in a tight arc. If excessive stress is applied, especially near the connectors, optical characteristics may deteriorate. The radius of the arc in which the fiber is bent should not be less than the equivalent of 20 times the outside diameter of the fiber.

（3） Do not apply tight twists to Raytela® Optical Fiber. The optical characteristics of Raytela® Optical Fiber will decline if used while being twisted.

（4） In addition to the above, avoid applying excessive force, repetitive bending, and dropping.

2. Precautions against chemical environmental factors

（1） Do not bring Raytela® Optical Fiber into contact with plasticizers (Phthalate, etc.) and/or soft PVC material (including: electric wire jacket, vinyl tape etc.). Plasticizers may move thus, the optical characteristics may deteriorate. Please test in advance to check for negative effects.

（2） When Raytela® comes in contact with detergents, adhesives, oils, solvents and other chemicals, the optical characteristics may deteriorate. Verification of the resistance of Raytela® against these chemicals should be confirmed in the technical specification manuals.

3. Precautions against other environmental factors

（1） Under high moisture conditions, to maintain the quality of the fiber, it is necessary to devise a cable that will keep excessive moisture out of Raytela® Optical Fiber.

（2） Avoid using Raytela® Optical Fiber in environments where it will be exposed to ultraviolet rays, radioactive rays and other special energy rays.

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