



# **POF** For Medical Applications

**ESKA™ Plastic Optical Fiber**

**Introducing  
New**

**Fiber-Torch<sup>SM</sup>**

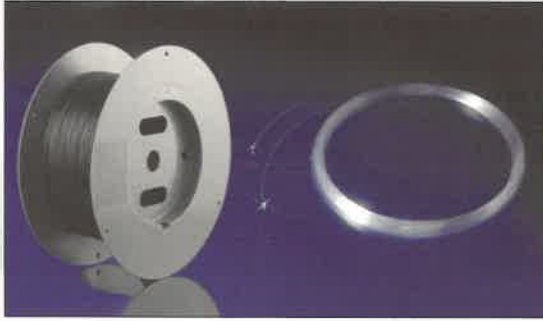
**and PIF**

*"Plastic Image Fiber"*

# ESKA™

## *Plastic Optical Fiber* FDA Certified PMMA Core

Preferred as designed-in *Plastic Optical Fiber/Cable* ... built-in for the engineering and manufacture of numerous medical products that are application driven. Incorporates optically pure, FDA certified, polymethyl methacrylate polymer core - PMMA.



Consistent with the rapid integration of advanced technology, POF has become a proven component that offers lasting reliability, ease of use and lower cost. Based on more than 35 years of dedicated research and development, Mitsubishi now supplies task-specific medical and surgical advanced applications in which POF is incorporated for lighting purposes; critical site illumination; medical tool positioning (sensing); as well as light-delivery media for adhesive curing; image transfer; plus multiple data control functions for both portable

and fixed instrumentation. Of upcoming importance and development is the integration of POF fibers as part of the disposable element within catheters. Mitsubishi is the market leader for POF technology.

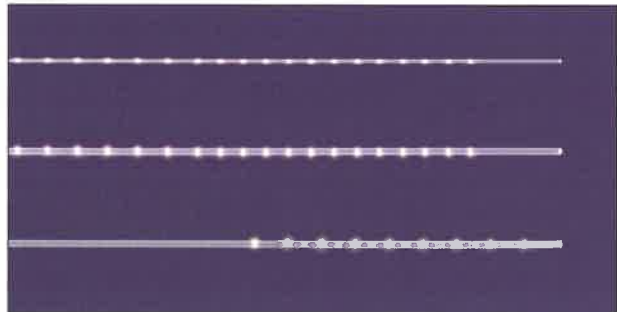
**Exclusive!**

# Fiber-Torch<sup>SM</sup>

*Side Glow • Light Pipes*

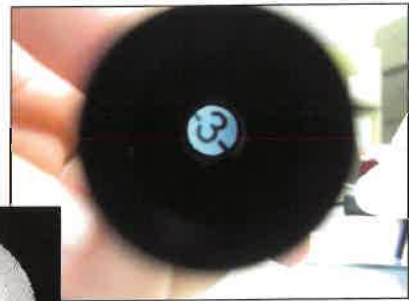
**Fiber-Torch** represents Plastic Optical Fiber which functionally enables launched light to be evenly bright, glowing along the length of the fiber. Typically, fiber optics is made to transfer light from one end to the other (known as end-lit fiber). **Fiber-Torch** is the result of highly accurate processing that will provide a fiber with the clad removed around the circumference, either at 360° and 220°, or whichever spaced intervals are required.

Mitsubishi supplies **Fiber-Torch** with the clad removed, cut to length and processed for lengths to 14" of a single end source, and to 36" for dual end sources. The fiber length with clad removed, in a spaced interval pattern, is determined by the interval size and number of points.



# PIF *Plastic Image Fiber with PMMA Core*

Mitsubishi has reinforced its Plastic Image Fiber technology by adding smaller fused bundle sizes appropriate for medical applications. Made from PMMA materials, the product is considerably lower in cost than glass versions. In-turn, it may be used as part of a disposable scope with POF light guides. In addition, whatever the overall diameter of the image conduit, bundles are made of 7,095 pixels. Maximum usable length of the PMMA image fiber is approximately 3 meters, depending on clarity required by the application. Current diameters available are 2.5mm and 2.0mm. The 1.0mm, 0.75mm and 0.5mm products are under development.

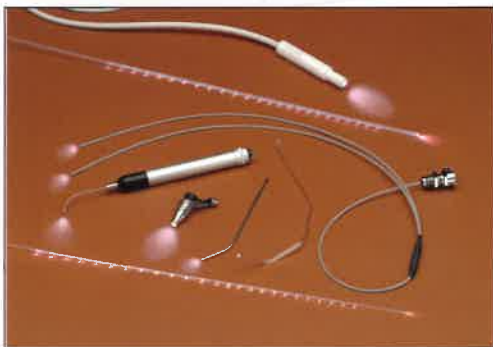


Above: image picture through PIF



Right: high resolution PIF

## Value-Added **POF** Products



While "*Fiber-Torch*" is a prime example of Mitsubishi's precision processing capabilities for fibers and cables, market demands often require extended accuracy/quality to meet innovative customer needs. Moreover, some added-value concepts offered are: fiber shaping with a pre-designed radius; angle cutting of fibers; combining lenses with fibers; fiber arrays; special bundles; and a variety of connector and termination techniques. Mitsubishi studies customer specific designs, suggests improvements or cost-saving ideas as needed, and will manufacture marketable POF products and sub-components in small or large quantities for medical and other precision-engineered markets. Preliminary services include designing, engineering, prototypes, and sampling.

## **POF** *Structural Facts & Features*

**ESKA™** Plastic Optical Fiber offers a concentric double-layer structure with the optically pure PMMA core; and a special transparent polymer cladding (thin outer layer). This cladding has a lower refractive index than the core, thus retaining the integrity of the launched light within the fiber. These unique structural advantages stress the benefit potential of POF technology. Among these are:

- Impervious to EMI/RFI
- Low transmission loss in the visible spectrum range
- Short distance light transfer in IR & UV
- Wide bandwidth capability
- Large light acceptance angle of 60°
- Highly flexible, with tight and cycled bending capabilities
- Excellent mechanical durability and reliability
- Extensive temperature range from -55C to 105C
- Lower component, systems and handling costs

A wide variety of *ESKA*<sup>™</sup> fibers are available to suit most applications. Fiber diameters range from 0.25mm to 3mm. Product offerings include single fibers, bundle fibers, and fused coherent image bundles. In addition, an assortment of standard as well as special fiber cables ideal for a range of environmental conditions and applications are also available.

### Products Typically Used in Medical Applications

Type	Fiber Dia.	Breaking Stress (typical data)	Breaking Strain by Elongation (typical data)
		kg/fiber	%
SK-10	0.25mm	0.7	100
SK-20	0.5mm	3	90
SK-30	0.75mm	6	100
SK-40	1.0mm	11	100
SK-60	1.5mm	22	130
SK-80	2.0mm	28	130

[www.fiberopticpof.com](http://www.fiberopticpof.com)

 **Mitsubishi International Polymer Trade Corporation**

2 Penn Plaza East, 11th Fl., Newark, NJ 07105 • Tel: 862-371-9957 • [lei.ge@mipna.com](mailto:lei.ge@mipna.com) • [www.mipna.com](http://www.mipna.com)

*ESKA*<sup>™</sup> is a Registered Trademark of Mitsubishi Rayon Co., Ltd.