

# DIAMOND

## Fiber Optic Components

### PSf - Free Space applications

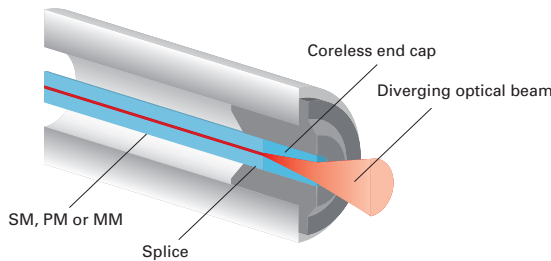
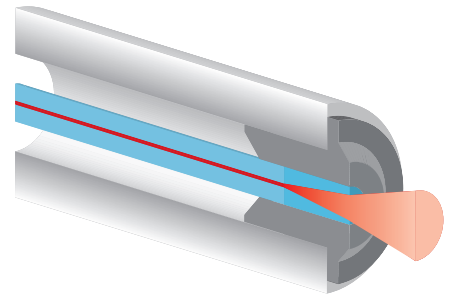
#### OPTICAL INTERFACE

DIAMOND proposes PSf technology for high power free space applications. This technology (splicing a glass endcap to a fiber) is applicable to all common connectors and is used to reduce burning problems on the fiber for free space application using high power optical beams.

Particle(s) burning at the glass-air interface are the first cause of failure for high power connectors. This occurs at around 0.3 MW/cm<sup>2</sup> power density for particles with 1µm diameter.

The PSf technology reduces the power density at the glass-air interface by splicing a coreless fiber end cap on the fiber (SM, PM or MM).

PSf, PSf-PM



#### STANDARDS

The PSf technology can be used in the following mechanical interfaces

- ▶ E-2000® IEC 61754-13
- ▶ FC IEC 61754-28
- ▶ DMI, Mini AVIM® Diamond standard
- ▶ Others upon demand (F-3000®, SC, AVIM® and FSMA)

#### BENEFITS

- ▶ Reduction of power density at interface
- ▶ Reduced sensitivity to impurities
- ▶ High return loss
- ▶ Customizable upon request

#### TYPICAL CHARACTERISTICS

PSf and PSf-PM typical performances			
Parameter	Abbreviations	Tolerance	Measurement conditions
Coreless fiber length	L	Nominal value L ±30µm	Design parameter
Spot diameter	D	Nominal value D ±10%	1/e <sup>2</sup> ≈ 13.5% white light
Eccentricity	e	≤ 5µm	Spot center to fiber center
Numerical aperture	NA	Original fiber ± 10%	1/e <sup>3</sup> ≈ 5% white light
Environment Characteristics			
Operating Temperature	-40 to +85	°C	
Non-Operating Temperature	-40 to +85	°C	

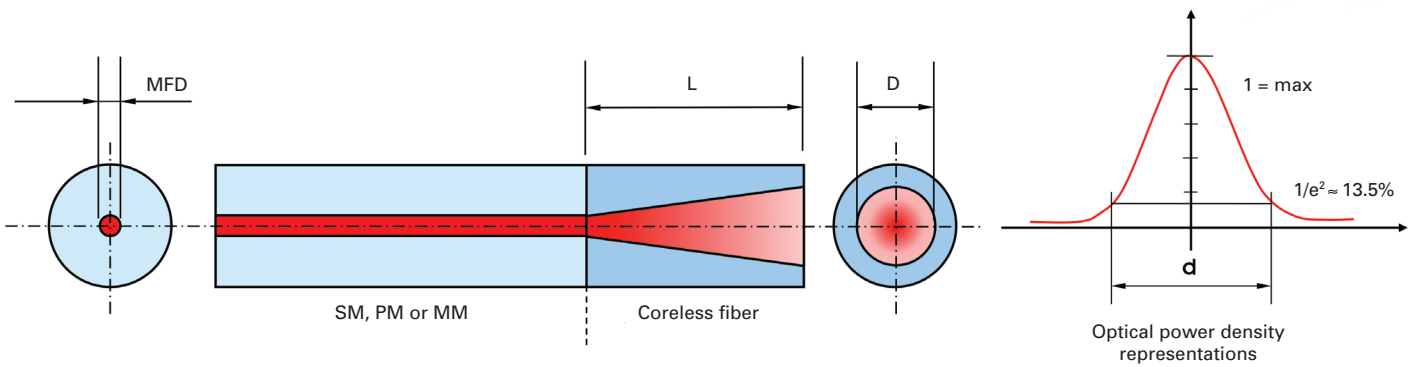


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Specifications subject to change  
without notice

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## MODELIZATION

In the PSf technology, the spot diameter  $D$  is defined as the mode field diameter (MFD) of the output beam at the coreless fiber-air interface. It corresponds to the diameter where the intensity has dropped to  $1/e^2$  of the intensity on the beam axis.  $D$  depends on:

- ▶ the length of the coreless fiber section ( $L$ )
- ▶ the mode field diameter (MFD) of the original fiber
- ▶ the numerical aperture (NA) of the original fiber
- ▶ the optical wavelength

## HOW TO ORDER

The customer shall specify:

- ▶ connector type
- ▶ polishing angle (PC 0° or APC 8°)
- ▶ datasheet of the original SM, PM or MM fiber (MFD, NA, etc.)
- ▶ optical wavelength
- ▶ optical power
- ▶ optional: desired spot diameter  $D$  or desired coreless fiber length ( $L$ )\*

\* If  $D$  or  $L$  is not explicitly specified by the customer, the length  $L$  of the coreless fiber and its diameter (125, 200, 250 or 400  $\mu\text{m}$ ) will be automatically selected by Diamond to assure a safe power density at the glass-air interface, based on the optical power.

## OPTIONS UPON REQUEST

- ▶ Spot diameter measured at specific wavelengths
- ▶ PSf NA measured at specific wavelengths
- ▶ Measurement of the 2D intensity profile
- ▶ Metal ferrules for improved thermal conductivity
- ▶ Antireflection coatings for specified wavelengths