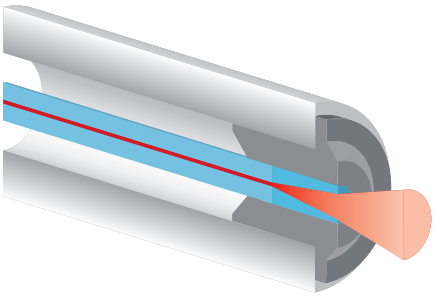
DIAMOND
Fiber Optic Components

OPTICAL INTERFACE

PSf - Free Space applications

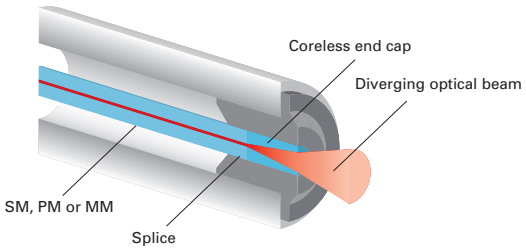
PSf, PSf-PM



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/cm2 power density for particles with 1um 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).



STANDARDS

The PSf technology can be used in the following mechanical interfaces

- E-2000® IEC 61754-15
- FC IEC 61754-13
- F-3000® IEC 61754-28
- DMI, Mini AVIM® Diamond standard
- Others upon demand (FC, SC, AVIM® and FSMA)

IEC 61754-13:2006 - Fibre optic connector interfaces - Part 13: Type FC-PC connector

IEC 61754-15:2009 - Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 15: Type LSH connector family

IEC 61754-28:2012 - Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 28: Type LF3 connector family

BENEFITS

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

TYPICAL CARACTERISTICS

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

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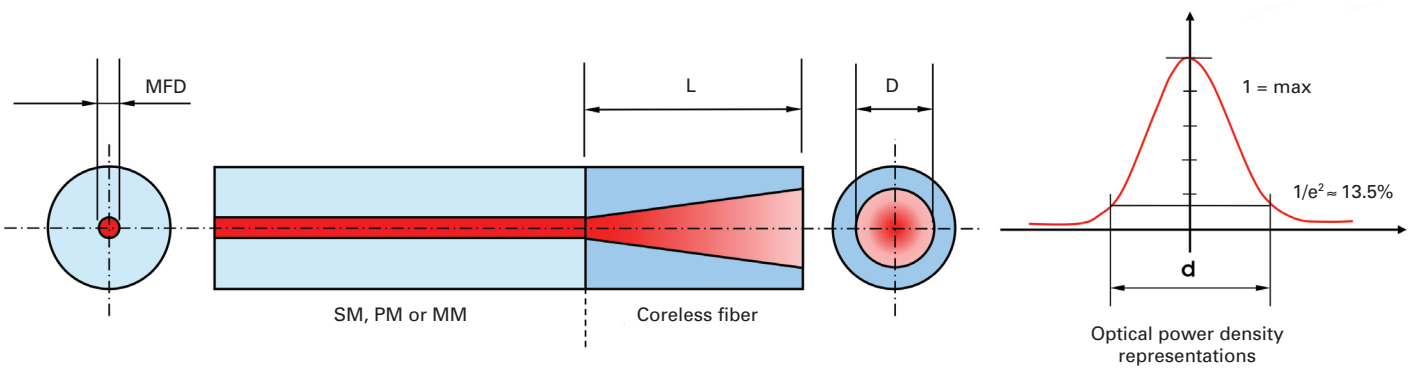

MODELIZATION

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 µm) 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