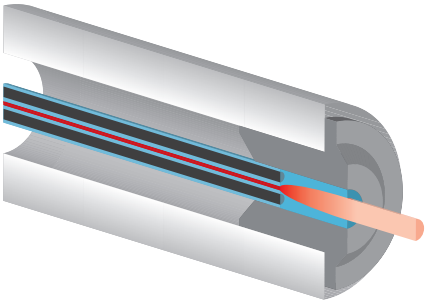
DIAMOND
Fiber Optic Components

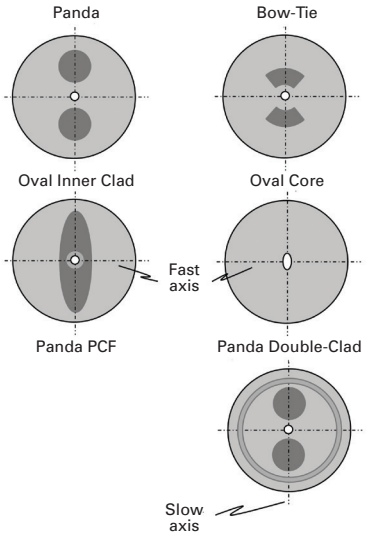
OPTICAL INTERFACE

PM-PS

(Polarization Maintaining and Power Solution)

The continuous growth in the laser technology has broadened the requirements for more complex and higher performance systems. Specific applications demand the combination of multiple features that allow supporting polarization maintaining (PM) properties in the presence of higher optical power densities. Diamond offers power solutions (PS) optical interfaces that support both requirements. The Diamond PM-PS interface addresses the reliability issues related to optical power densities close or above the damage (or safety) threshold for single mode fibers and the propagation of polarization information.
Our PM contact solution can be implemented on all connector types integrated with a keying mechanism for polarization orientation purposes and it is compatible with Diamond's Power Solution technology.





APPLICATION FIELDS

PM-PS applications are expanding due to the novelty and uniqueness of the solution. Some applications include:

- Lidar
- Optical fiber laser systems and amplifiers
- Sensing

FEATURES AND BENEFITS

- Low Insertion loss due to our proprietary Active Core Alignment (ACA) process
- Ultra high polish for High Return loss
- Improved power resistance (x16)
- Extremely low angular offset
- High Extinction Ratio thanks to Active Polarization Orientation (APO)

Diamond uses a 0.1dB-grade ferrule with diameter tolerances < 0.2 µm and front face geometry that exceeds the current international standards:

- Ferrule radius 10÷20 mm
- Core apex <62.5 µm
- Fiber height 200÷ -50nm

STANDARD PERFORMANCES

WAVELENGTH (nm)	Angular Error ϕ	IL (dB)		PER (dB)		RL (dB)	
		Typ	97% (TBC)	Typ	Min (TBC)	PC 0°	APC 4°
1625 - 1550 - 1310 1060 - 980	< +/-2°	0.4 0.6	0.8 1	25 23	23 21	45* 35	70* 60*
TEST CONDITIONS		IEC 61300-3-34 Random mating		IEC 61300-3-40 Low coherence		IEC 61300-3-6 *OLCR method <OCWR method	
Lifetime	500 mate/demate cycles						

- Operating temperature: +10°C / +60°C
- Storage temperature: -40°C / +85°C
- Optical values specified at room temperature, and based upon high-quality Panda and fibers qualified by Diamond (fiber's NA 0.12± 0.02). PER variation over operating temperature: +/- 2dB.
- PER values refer to one PM-PS connector only. For patchcords, PER values will be slightly lower.
- Performances based upon E-2000™ optical interfaces; other mechanical interfaces may lead to slightly different results. Please contact Diamond for details.
- Diamond performs PER measurements according to the crossed-polarizer method (similar to IEC 61300-3-40) that relies upon high-extinction Glan-Thomson polarizers and incoherent light sources (bandwidth > 10 nm).

DIAMOND
the fiber meeting

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Specifications subject to change without notice

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The PM-PS optical interface comprises:

- 0.1dB grade ferrules with a diameter tolerance < 0.2um
- Active Core Alignment (ACA) with low exit angle < 0.15°
- Increased Mode Field Diameter * ~35µm
- Ultra-polish with 100% end face inspection for PC and 4° APC

* May vary with fiber type

AVAILABLE CONNECTOR INTERFACE

DIAMOND's technology is applied to all connector interfaces with an integrated mechanical keying feature. We offer both fiber pigtails and patchcords with the following connectors:

- E-2000™
- DMI
- Mini-AVIM

QUALITY & STANDARDS

Product quality is guaranteed in compliance with International Standards defining PM fibers and connectors. These include the IEC 61755-3-7/8 standard (PC, resp. APC 2.5 mm and 1.25 mm composite ZrO2 with Titanium ferrules) dedicated to standard single-mode fibers at conventional telecom wavelengths (1310/1550 nm bands).

SAFETY INFORMATION FOR POWER SOLUTION CONNECTORS

The Power Solution (PS) connector utilizes expanded beam technology to reduce the density of the optical power at the interface of the connection. This insures that the connector is less sensitive to contamination and maximum power can be transmitted to the connector without damage.

CLEANING

Cleanliness is a high priority when dealing with high power applications. As such, the basic concept when using PS connectors is as follows:

- Before each mating procedure, the connectors must be absolutely clean and inspected with a microscope.
- The ferrule`s surface inspection should be performed using an optical microscope with a magnification of at least 200x.
- The connector is normally affected by contamination during handling and mating procedures and the degree of cleanliness of the overall installation is also a critical parameter to be taken into consideration.

HANDLING

Power Solution connectors should be operated only when connected to high power. When unmated, the light source must absolutely be switched off.

SAFETY

Optical connectors are passive components not subjected to Laser safety, but will be when integrated in an active system, such as the output side of a light source.

The following aspects are taken into account when evaluating laser safety requirements:

- The exit beam of these connectors must have a lower Numerical Aperture (NA) as standard connectors in air (NA=0.035) or ca. 2° divergence. This is used in the calculation of the amount of light that can enter the pupil at 1m.
- The DMI connector does not have a protection cap, therefore, Diamond recommends to putting a protection cap on top with the indication of the laser class according to IEC 60825-1.

The following safety precautions are to be considered as a starting point and each individual is responsible to insure and demand proper safety protocols. The following precautions should not be considered as sufficient and should be re-evaluated from case-to-case.

- Use in a restricted area and allow access only to authorized and qualified personnel.
- Use protective glasses; skin protective measures are also recommended.
- Keep optical behaviour under control: eliminate reflections (also diffuse), close unused optical channels, and avoid light beams at eye level.
- Switch the system on/off with a remote control or interlock and utilize an additional automatic switch off safety ystem.
- Provide a warning signal when sources are active.
- Provide laser classification markings and danger indications.

Systems that rely upon a minimum required RL level, should use a non-contact PC version with possibly interlock capabilities.

ORDER INFORMATION

To order your connectors using PM-PS technology, please specify:

- Connector type (E-2000™ PM-PS, DMI PM-PS), wavelength and end-face (PC or APC).Example: DMI PM-PS 1550 PC or E-2000™ PM-PS 980 APC
- Fiber characteristics: MFD, NA, fiber type, coating structure and material, operating wavelength
- Please refer to the individual data sheets for detailed specifications on individual connector types.