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Crystal Fibre • *aero*LASE • Koheras • SuperK

DC-200/40-PZ-Si

Large Mode-area | Single Mode | Polarization Maintaining | Coil Control

Single-mode, polarizing double-clad fiber with large mode area

- Single mode, single polarization
- Large mode area
- High NA circular pump core
- Coil Control ensuring excellent stability

The DC-200/40-PZ-Si is a passive (undoped), large mode area, single mode core embedded in a high NA multimode fiber structure. This fiber is substantially similar to our DC-200/40-PZ-Yb active Yb-doped fiber, but with a pure silica core, and can be used to optimize procedures that will be used with the active version.

The inner cladding has a high numerical aperture (NA) due to the large index step between the air hole ring and silica. Microstructuring of the inner cladding allows a large mode field diameter while still maintaining a superior beam quality. The all-silica fiber sustains high power levels. It features a mode area of more than 700 μm^2 while keeping single-mode beam quality. Moreover, the fiber is polarizing resulting in improved PER compared to normal polarization-maintaining fibers.

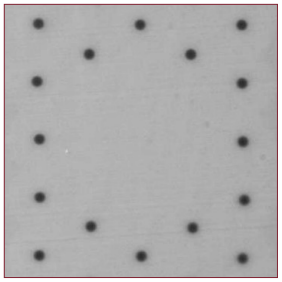
The fiber can also be used in applications requiring single-mode beam propagation in one direction and at the same time collection and propagation of scattered light or luminescence in the other direction for detection.

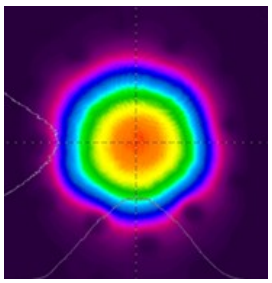
The fiber is available with sealed ends or with end-caps and high power SMA connectors.

Applications

- Optimization of cleaving, splicing, and coupling techniques to be used with the active fiber version
- Single mode pulse delivery with collection of light from a broad angle

Optical properties	
Signal core	
Mode properties	Single mode
M^2 @ 1060 nm	< 1.3
Mode field diameter	30 ± 2 µm
Mode field area	700±100 μm^2
NA @ 1060 nm	~ 0.03
Multimode pump core	
Numerical aperture @ 950 nm	0.55 ± 0.05
Polarization Parameters	
Birefringence Δn	$1 \cdot 10^{-4}$
Polarization Extinction Ratio	> 15 dB



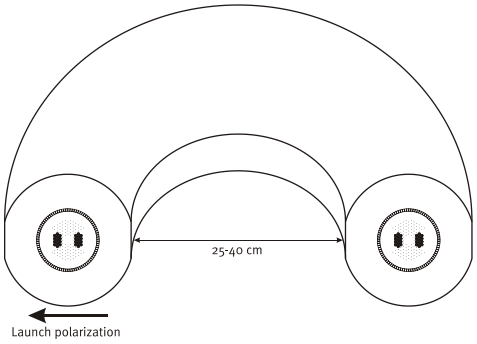


Left: Optical microscope picture of the core region. **Right:** Near field measured at 1060 nm.

Physical properties	
Signal core diameter	40± 2 µm
Inner cladding diameter, ID	200± 5 µm
Outer cladding diameter, OD	450± 20µm
Coating diameter	540± 30 µm
Core, outer and inner cladding material	Pure silica
Coating material, single layer	HT acrylate

Coil Control

The DC-200/40-PZ-Si features Coil Control, ensuring that the fiber always coils in the correct plane for superior mode stability and easy use. We recommend a bending diameter in the 25-40 cm range. Best PER is obtained when operating the fiber in the slow axis. Note that degradation of the PER and efficiency can occur if the fiber is forced to coil in a different plane or twisted in the coil.



The single-mode advantage

All our double-clad fibers in the Crystal Fibre range are strictly single-mode leading to several advantages compared to standard multimode LMA fibers:

- Better output stability
- Highest possible beam quality
- No requirements on tight coiling
- No coiling-induced mode area compression

Covered by U.S. Patents 5907652, 6334019, 6603912, 6888992