

DC-200-40-PZ-Yb-01

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

- Single mode, single polarization
- Large mode area
- High pump absorption
- High NA circular pump core
- Efficient pump absorption - no skew rays

The DC-200/40-PZ-Yb-01 represents the top performance in flexible ytterbium fibers. It features a mode area of more than $650 \mu\text{m}^2$ while keeping single-mode beam quality. Moreover, the fiber is polarizing resulting in improved PER compared to normal polarization-maintaining fibers.

The multimode pump light is guided by our proven airclad technology, ensuring low loss, high damage threshold and a large numerical aperture (NA). The large NA relaxes tolerances on coupling optics and facilitates the use of lower brightness diodes.

The combination of robust single-mode guidance, excellent PER and a large mode-area, has made the DC-200/40-PZ-Yb-01 the preferred choice for many industrial fiber laser manufactures in the high end segment.

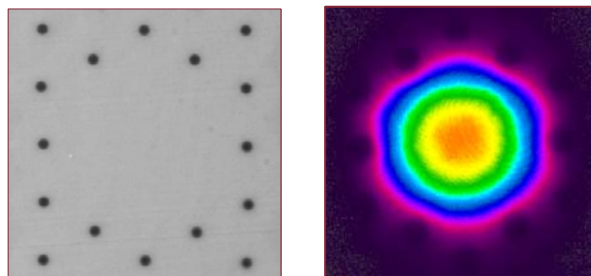
The fiber is available with sealed ends, end-caps and high power connectors as an option.

Applications

- High pulse energy fiber amplifiers
- Fiber lasers

Optical properties	
Signal core	
Mode properties ⁽¹⁾	Single mode
M^2 @ 1060 nm ⁽¹⁾	< 1.3
Mode field diameter	$29 \pm 2 \mu\text{m}$
Mode field area	$650 \pm 100 \mu\text{m}^2$
NA @ 1060 nm	~ 0.03
Multimode pump core	
Numerical aperture @ 950 nm	0.55 ± 0.05
Pump absorption @ 920 nm	~ 3 dB/m
Pump absorption @ 976 nm	~ 10 dB/m
Polarization Parameters	
Birefringence Δn	$1 \cdot 10^{-4}$
Polarization Extinction Ratio	> 15 dB

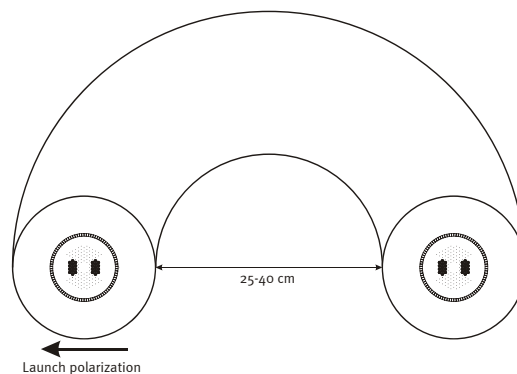
Covered by U.S. Patents 5907652, 6334019, 6603912, 6888992



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

Physical properties	
Signal core diameter	$40 \pm 2 \mu\text{m}$
Inner cladding diameter, ID	$200 \pm 5 \mu\text{m}$
Outer cladding diameter, OD	$450 \pm 20 \mu\text{m}$
Coating diameter	$620 \pm 30 \mu\text{m}$
Outer and inner cladding material	Pure silica
Coating material, single layer	HT acrylate

⁽¹⁾ It is recommended to orient the fiber with the slow axis in the bending plane (see illustrated below) and to use a bending diameter in the range 25-40 cm. Best PER is obtained when operating the fiber in the slow axis. Degradation of the PER and efficiency can occur if the fiber is twisted in the coil (i.e. if the polarization axes are not oriented identically at in- and output).



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

DC-200-40-PZ-Yb-01-100409