SPECIALTY OPTICAL FIBER

IXF-VLMA-40-220-PM-YB-V1

Very Large Mode Area Fiber

The development of this new Polarisation Maintening (PM) Ytterbium doped Very Large Mode area (VLMA) fiber was driven by customer's demand for an easy to integrate double-clad fiber in the continuously growing ultrafast fiber laser market. The combination of robust single mode behavior in an all-solid glass form factor with 750 μm^2 fundamental mode area makes this fiber an ideal tool for high-end industrial fiber laser manufacturers.

Photonics Bretagne proprietary manufacturing process (patent pending) enables preferential fiber coiling and automatic amplifier output polarization orientation. Complementary matching GRIN fiber is available for all-fiber monolithic integration with standard LMA 10-125 PM pump combiners.

Benefits & Features

- Truly single mode polarization maintaining behavior
- All-solid step index design
- 750 μm^2 core surface area
- Photodarkening free silica matrix

Benefits & Features

- High power ultrafast pulsed fiber lasers
- Material processing
- LIDAR

Related Products

- IXF-2CF-PAS-PM-11-130-0.08
- IXF-GRIN-VLMA40220

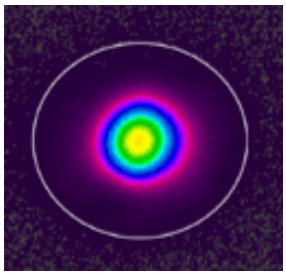
Related Publications

- Sub-500 fs high power quasimonolithic FCPA laser using an all-solid step-index flexible PM VLMA Yb-doped fiber amplifier; https://doi.org/10.1117/12.2624096

Optical parameters

Cladding numerical aperture	≥ 0.46
Measured cladding absorption @915 nm (dB/m) *	2.7 ± 0.2
Measured cladding absorption @976 nm (dB/m) *	8.0 ± 0.5
Core numerical aperture	0.045 ± 0.005
LP_{01} MFD @1060 nm (µm) **	32 ± 2
Effective area aeff @1060 nm (μm^2)	750 ± 40
Background loss @1150 nm (dB/km)	≤ 10
Cladding loss @1300 nm (dB/km)	≤ 35
Birefringence @1060 nm	≥ 1 x 10^{-4}
Fiber efficiency (%) ***	≥ 75 (typical)
Recommended coiling diameter (cm)	16 ± 2
M^2 beam quality factor	≤ 1.5

* Cut-back, small-signal with a broadband light source
** When straight fiber at the exit
*** Evaluated with 1040 nm signal in 976 nm forward pumping configuration, at optimal coiling diameter



Beam profile after VLMA fiber in laser configuration.

Physical parameters

Core diameter (µm)	40 ± 3
Core concentricity error (µm)	≤ 0.5
Cladding diameter (µm)	230 ± 7
Coating outside diameter (µm)	335 ± 10
Coating type	Low index acrylate
Fiber geometry	Circular with opposite flats

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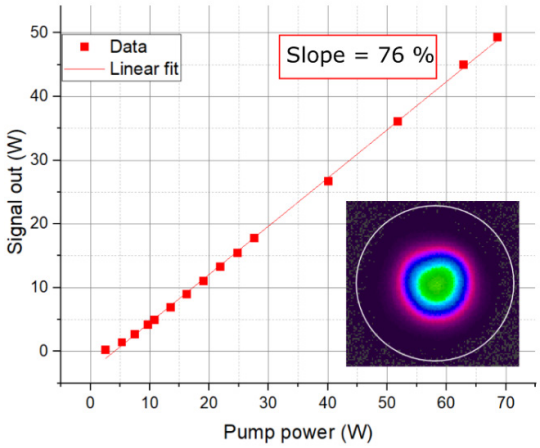
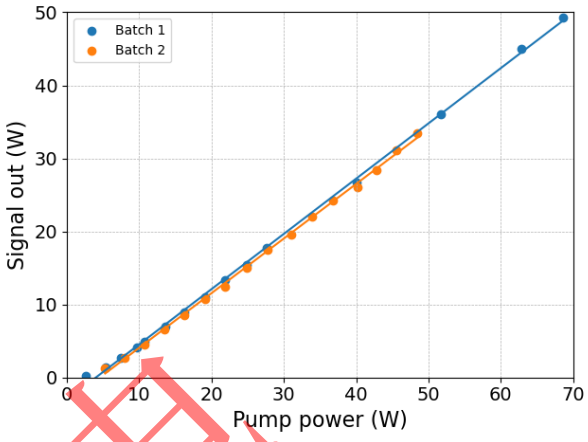
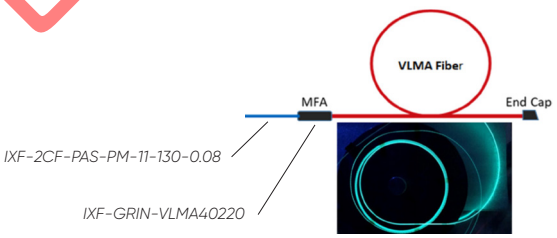


FCPA laser using an all-solid step-index flexible PM VLMA Yb-doped fiber amplifier.



Comparison of the batch to batch VLMA fiber efficiency.



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