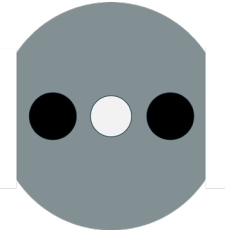


## SPECIALTY OPTICAL FIBER

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

Partnership with



## Very Large Mode Area Fiber

The development of this new Polarisation Maintaining (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  $750 \mu\text{m}^2$  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 matched passive and GRIN fibers are available for all-fiber monolithic integration.

### Benefits & Features

- Truly single mode polarization maintaining behavior
- All-solid step index design
- $750 \mu\text{m}^2$  core surface area
- Photodarkening free silica matrix

### Applications

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

### Related Products

- IXF-2CF-PAS-PM-40-220-004      Matched passive fiber
- IXF-2CF-PAS-PM-11-130-0.08
- IXF-GRIN-VLMA40220      GRIN fiber for MFA manufacturing

### 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); <https://doi.org/10.1117/12.2624096>

### Optical parameters

Cladding numerical aperture	$\geq 0.46$
Measured cladding absorption @915 nm (dB/m) *	$2.7 \pm 0.2$
Measured cladding absorption @976 nm (dB/m) *	$8.0 \pm 0.5$
Core numerical aperture	$0.045 \pm 0.005$
LP <sub>01</sub> MFD @1060 nm ( $\mu\text{m}$ ) **	$32 \pm 2$
Effective area $a_{\text{eff}}$ @1060 nm ( $\mu\text{m}^2$ )	$750 \pm 40$
Background loss @1150 nm (dB/km)	$\leq 10$
Cladding loss @1300 nm (dB/km)	$\leq 35$
Birefringence @1060 nm	$\geq 1 \times 10^{-4}$
Fiber efficiency (%) ***	$\geq 75$ (typical)
Recommended coiling diameter (cm)	$16 \pm 2$
M <sup>2</sup> beam quality factor	$\leq 1.5$

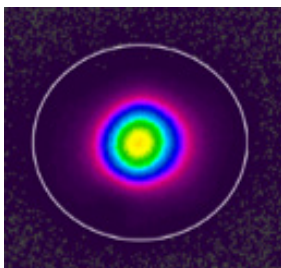
\* Cut-back, small-signal with a broadband light source

\*\* When straight fiber at the exit

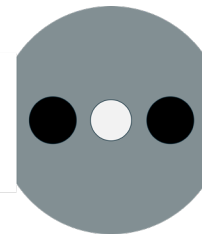
\*\*\* Evaluated with 1040 nm signal in 976 nm forward pumping configuration, at optimal coiling diameter

### Physical parameters

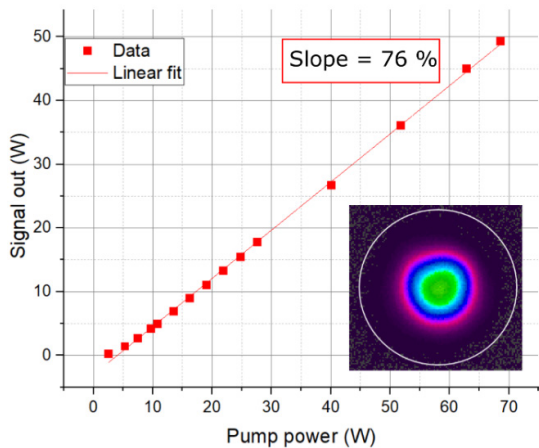
Core diameter ( $\mu\text{m}$ )	$40 \pm 3$
Core concentricity error ( $\mu\text{m}$ )	$\leq 0.5$
Cladding diameter ( $\mu\text{m}$ )	$230 \pm 7$
Coating outside diameter ( $\mu\text{m}$ )	$335 \pm 10$
Coating type	Low index acrylate
Fiber geometry	Circular with opposite flats



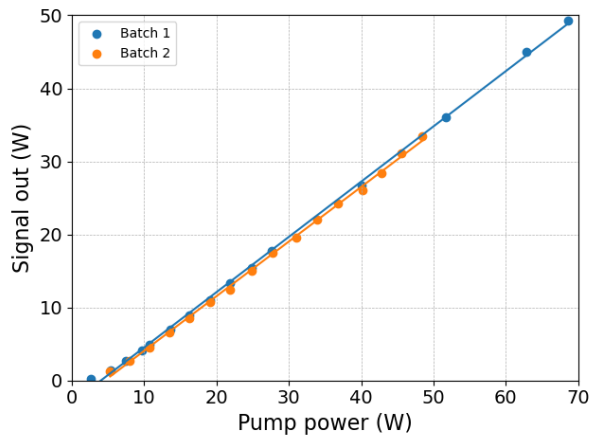
Beam profile after VLMA fiber in laser configuration.



## Very Large Mode Area Fiber



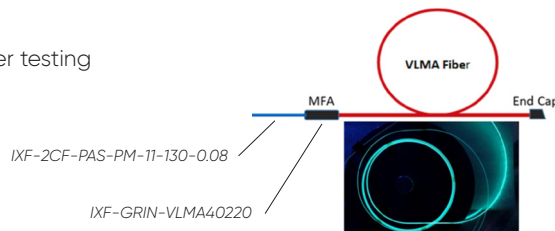
FCPA laser using an all-solid step-index flexible PM VLMA Yb-doped fiber amplifier.



Comparison of the batch to batch VLMA fiber efficiency.

### Also available: VLMA fiber assembly

- VLMA fiber functionalized and ready to use, accelerating prototyping and fiber testing
- MFA to passive fiber IXF-2CF-PAS-PM-11-130-0.08
- Assembly tested in laser configuration
- Thermal behavior of the MFA verified with infrared camera
- Customizable lengths of VLMA and passive fibers



VLMA fiber assembly needs to be ordered separately from VLMA fiber, contact your sales representative.

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