

ACTIVE FIBRES VERY LARGE MODE AREA FIBRE 40 µm core diameter



Applications

High power ultrafast pulsed fiber lasers/amplifiers for

material processing, life

science, spectroscopy or

defense applications.



The development of the new Polarisation Maintaining (PM) Ytterbium doped Very Large Mode Area (VLMA) fibre was driven by demand for an easy to integrate double-clad fibre in the growing ultrafast fibre laser market. The combination of robust single mode behaviour in an all-solid glass form factor with 750 µm² fundamental mode area makes this fibre an ideal tool for high-end industrial laser manufacturers. fibre manufacturing⁽¹⁾ Proprietary process enables preferential fibre coiling and automatic amplifier output polarization orientation.

Complementary matching GRIN and passive VLMA fibres are available for all-fibre monolithic integration with standard LMA 10-125 PM pump combiners. Module assembly also available on request.

⁽¹⁾ Photonics Bretagne patent (WO/2022/112152).

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Main characteristics

- Truly single mode polarization maintaining behavior
- All-solid step index based fibre design based on our all-vapor phase delivery process
- Industry standard low index polymer coating providing long term reliability & performance
- Excellent fibre lot uniformity and consistency

Fibre specifications

Fibre type	VLMA-40-220-PM-YB-V1
Optical parameters	
Background loss @ 1150 nm (dB/km)	< 10
Cladding loss @ 1300 nm (dB/km)	< 35
Cladding numerical aperture	≥ 0.46
Measured cladding absorption @ 915nm (dB/m) $^{(2)}$	2.7 +/-0.2
Measured cladding absorption @ 976 nm (dB/m) $^{(2)}$	8.0 +/- 0.5
Core numerical aperture (NA)	0.045 +/- 0.005
LP01 MFD @ 1060 nm (µm) (3)	32 +/- 1
Effective area aeff @ 1060 nm (µm2)	750 +/- 40
Birefringence @ 1060 nm	≥ 1.10 x 10 ⁻⁴
Beam quality - M ² Parameter ⁽⁴⁾	<1.5 (see picture)
Typical fibre efficiency (4)	75 % typical (see curve)
Recommended coiling diameters (cm)	14
Physical/Material parameters	
Core diameter (µm)	40 +/- 3
Core concentricity error (µm)	< 0.5
Cladding fibre outside large diameter (µm)	230 +/- 7
Coating outside diameter (µm)	335 +/- 10
Coating type	Low Index
Fibre geometry	Circular with opposite flats

 $^{\scriptscriptstyle (2)}$ Cut-back, small-signal with a broadband light source - Other absorption level on request

(3) Straight fibre

⁽⁴⁾ Evaluated with 1040nm signal in 976 nm forward pumping configuration

Schematic view of one VLMA module unit including Mode Field Adaptor (MFA) and end-cap

MFA Standard 10/125 DC input fibre

VLMA fibre efficiency and output beam mode quality



