

20/400 Precision Matched Active LMA Double Clad Fibers



Nufern's matched series of Large Mode Area (LMA) double clad fibers are ideal for high power monolithic fiber lasers and amplifiers. Featuring a matching set of LMA fibers, this series of fibers ensure splice compatibility across the entire chain of 20/400 fiber components, such as fiber Bragg gratings and couplers, required to make monolithic fiber lasers. This matched fiber series is based on a 20 micron diameter core and 400 micron diameter clad size with a low NA (0.065) core and consists of Yb-doped fiber, photosensitive fiber and passive beam delivery fibers all made to highest tolerances in the industry. All fibers utilize the latest glass composition and NuCOAT fluoroacrylate coating technology to ensure high slope efficiency, extended operating life and excellent beam quality at the high power levels demanded by today's industrial fiber laser applications. These precision matched LMA fiber sets are available in non-PM (LMA) and PM (PLMA) versions.

Typical Applications

- Monolithic high power lasers & amplifiers
- LMA fiber couplers, pump combiners & FBG
- High power pump & signal pigtails
- Military, industrial and medical

Features & Benefits

- Matched fiber series – Ensures splice compatibility across the 20/400 matched series of fibers
- NuCOAT fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- State of the art Yb-doped glass — Useful for generating high CW powers
- PANDA-style stress structure for increased birefringence — Superior optical performance and uniformity
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling

Optical Specifications

	PLMA-YDF-20/400-M	LMA-YDF-20/400-M
Operating Wavelength	1060 – 1115 nm	1060 – 1115 nm
Core NA	0.065 ± 0.005	0.065 ± 0.005
First Cladding NA (5%)	≥ 0.46	≥ 0.46
Core Attenuation	$\leq 50.0 \text{ dB/km} @ 1300 \text{ nm}$	$\leq 30.0 \text{ dB/km} @ 1300 \text{ nm}$
	$\leq 25.0 \text{ dB/km} @ 1200 \text{ nm}$	$\leq 15.0 \text{ dB/km} @ 1200 \text{ nm}$
Cladding Attenuation	$\leq 15.0 \text{ dB/km} @ 1095 \text{ nm}$	$\leq 15.0 \text{ dB/km} @ 1095 \text{ nm}$
Cladding Absorption	1.5 dB/m at 975 nm	0.40 $\pm 0.05 \text{ dB/m}$ at 915 nm
Birefringence	$0.5 \pm 0.1 \text{ dB/m}$ at 915 nm	N/A
Slope Efficiency	$\text{nominal } 4 \times 10^{-4}$	$> 70.0\% @ 915 \text{ nm}$

Geometrical & Mechanical Specifications

Cladding Diameter	$405.0 \pm 10.0 \mu\text{m}$	N/A
Cladding Diameter (flat-to-flat)	N/A	$400.0 \pm 10.0 \mu\text{m}$
Core Diameter	$20.0 \pm 1.5 \mu\text{m}$	$20.0 \pm 1.5 \mu\text{m}$
Coating Diameter	$550.0 \pm 15.0 \mu\text{m}$	$550.0 \pm 15.0 \mu\text{m}$
Core/Clad Offset	$\leq 2.00 \mu\text{m}$	$\leq 2.00 \mu\text{m}$
Prooftest Level	$\geq 100 \text{ kpsi (0.7 GN/m}^2\text{)}$	$\geq 100 \text{ kpsi (0.7 GN/m}^2\text{)}$

Coating Requirements: Low index polymer coating. The precision matched passive fibers are also available- see PLMA-GDF-20/400-M and LMA-GDF-20/400-M



7 Airport Park Road, East Granby, CT 06026 • 860.408.5000 • Toll-free 866.466.0214 • Fax 860.844.0210 • E-mail info @ nufern.com • www.nufern.com • Nufern products are manufactured under an ISO 9001:2008 certified quality management system.

Custom developed fiber (FUD) specifications are subject to change without notice. Other configurations such as alternative form factors, optimized cut-off and UV cured color coating may be available. Let us know how Nufern can assist with your requirements.





20/400 Precision Matched Passive LMA Double Clad Fibers

Nufern's Large Mode Area (LMA) and Polarization Maintaining LMA (PLMA) passive double clad fiber are ideal for high power fiber lasers and amplifiers used in military, industrial, and medical applications. These fibers feature a 20 micron diameter core and 400 micron diameter clad size with a low NA (0.065) core. They are precision matched to their active Yb-doped 20/400 LMA and PLMA matched counterparts to ensure excellent splice compatibility and low loss. As with all Nufern standard Large Mode Area (LMA) fibers, these fibers are proof-tested to 100 kpsi, an industry requirement for long term reliability. They utilize the latest fiber design and NuCOAT™ coating technology to ensure excellent preservation of beam quality and extended operating life at the high power levels demanded by today's industrial fiber laser applications. These precision matched fibers are available in both non-PM and PANDA-style PM fibers.

Typical Applications

- High power fiber lasers
- CW and pulsed amplifiers
- Military, industrial and medical

Features & Benefits

- NuCOAT™ fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- LMA core design — Useful for transmitting high CW powers
- "Few" moded core design — Easy to maintain single mode LP01 beam through fiber & components
- PANDA-style stress structure for increased birefringence — Superior optical performance and uniformity
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling

Optical Specifications

	PLMA-GDF-20/400-M	LMA-GDF-20/400-M
Operating Wavelength	1060 – 1600 nm	1060 – 1600 nm
Core NA	0.065 ± 0.005	0.065 ± 0.005
First Cladding NA (5%)	≥ 0.46	≥ 0.46
Core Attenuation	$\leq 50.0 \text{ dB/km} @ 1300 \text{ nm}$	$\leq 30.0 \text{ dB/km} @ 1300 \text{ nm}$
	$\leq 25.0 \text{ dB/km} @ 1200 \text{ nm}$	$\leq 15.0 \text{ dB/km} @ 1200 \text{ nm}$
Cladding Attenuation	$\leq 15.0 \text{ dB/km} @ 1095 \text{ nm}$	$\leq 15.0 \text{ dB/km} @ 1095 \text{ nm}$
Birefringence	nominal 4×10^{-4}	N/A

Geometrical & Mechanical Specifications

Cladding Diameter	$395.0 \pm 10.0 \mu\text{m}$	$395.0 \pm 5.0 \mu\text{m}$
Core Diameter	$20.0 \pm 1.5 \mu\text{m}$	$20.0 \pm 1.5 \mu\text{m}$
Coating Diameter	$550.0 \pm 15.0 \mu\text{m}$	$550.0 \pm 15.0 \mu\text{m}$
Core/Clad Offset	$\leq 2.00 \mu\text{m}$	$\leq 2.00 \mu\text{m}$
Clad Non-Circularity	N/A	$\leq 0.50 \%$
Prooftest Level	$\geq 100 \text{ kpsi} (0.7 \text{ GN/m}^2)$	$\geq 100 \text{ kpsi} (0.7 \text{ GN/m}^2)$

These precision matched fibers are included in our precision matched sets - see PLMA-YDF-20/400-M and LMA-YDF-20/400-M



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Standard specifications and design parameters are listed above. Specifications are subject to change without notice. Other configurations such as alternative form factors, optimized cut-off and UV cured color coating may be available. Let us know how Nufern can assist with your requirements.

