

# 25/250 Precision Matched Active LMA Double Clad Fibers



Nuferm'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 25/250 fiber components required to make monolithic fiber lasers. This matched fiber series is based on a 25 micron diameter core and 250 micron diameter clad size with a low NA (0.065) core and consists of Yb-doped fiber and passive beam delivery fibers all made to highest tolerances in the industry. All fibers utilize the latest glass composition and NuCOAT 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

- High peak power amplifiers
- LIDAR
- Material processing
- Non-linear optics / frequency doubling

## Features & Benefits

- Matched fiber series – Ensures splice compatibility across the 25/250 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-25/250-M	LMA-YDF-25/250-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	≤ 45.0 dB/km @ 1300 nm ≤ 30.0 dB/km @ 1200 nm	≤ 45.0 dB/km @ 1300 nm ≤ 30.0 dB/km @ 1200 nm
Cladding Attenuation	≤ 15.0 dB/km @ 1095 nm	≤ 15.0 dB/km @ 1095 nm
Cladding Absorption	1.75 ± 0.15 dB/m at 915 nm 5.25 dB/m near 975 nm	1.60 ± 0.15 dB/m at 915 nm 4.80 dB/m near 975 nm
Birefringence	nominal $2 \times 10^{-4}$	N/A

## Geometrical & Mechanical Specifications

	PLMA-YDF-25/250-M	LMA-YDF-25/250-M
Cladding Diameter	255.0 ± 5.0 μm	N/A
Cladding Diameter (flat-to-flat)	N/A	250.0 ± 5.0 μm
Core Diameter	25.0 ± 1.5 μm	25.0 ± 1.5 μm
Coating Diameter	395.0 ± 15.0 μm	395.0 ± 15.0 μm
Core/Clad Offset	≤ 2.00 μm	≤ 2.00 μm
Proof test Level	≥ 100 kpsi (0.7 GN/m <sup>2</sup> )	≥ 100 kpsi (0.7 GN/m <sup>2</sup> )



Coating Requirements: Low index polymer coating. The precision matched passive fibers are also available- see PLMA-GDF-25/250-M and LMA-GDF-25/250-M



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 Nuferm can assist with your requirements.

NU0149- 11/07/2013



光技術をサポートする  
株式会社オプトサイエンス

<http://www.optoscience.com>

東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング TEL:03-3356-1064  
大阪営業所 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館 TEL:06-6305-2064  
名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル TEL:052-569-6064

E-mail : [info@optoscience.com](mailto:info@optoscience.com)



# 25/250 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 25 micron diameter core and 250 micron diameter clad size with a low NA (0.065) core. They are precision matched to their active Yb-doped 25/250 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 peak power amplifiers
- LIDAR
- Material processing
- Non-linear optics/frequency doubling

## Features & Benefits

- NuCOAT™ fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- LMA core design and short amplifier length — Useful for transmitting high peak 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

Operating Wavelength  
Core NA  
First Cladding NA (5%)  
Core Attenuation  
Cladding Attenuation  
Birefringence

## PLMA-GDF-25/250-M

1060 – 1600 nm  
0.065 ± 0.005  
≥ 0.46  
≤ 45.0 dB/km @ 1300 nm  
≤ 30.0 dB/km @ 1200 nm  
≤ 15.0 dB/km @ 1095 nm  
nominal  $2 \times 10^{-4}$

## LMA-GDF-25/250-M

1060 – 1600 nm  
0.065 ± 0.005  
≥ 0.46  
≤ 45.0 dB/km @ 1300 nm  
≤ 30.0 dB/km @ 1200 nm  
≤ 15.0 dB/km @ 1095 nm  
N/A

## Geometrical & Mechanical Specifications

Cladding Diameter  
Core Diameter  
Coating Diameter  
Core/Clad Offset  
Clad Non-Circularity  
Proof-test Level

247.0 ± 5.0 μm  
25.0 ± 1.5 μm  
395.0 ± 15.0 μm  
≤ 2.00 μm  
N/A  
≥ 100 kpsi (0.7 GN/m<sup>2</sup>)

247.0 ± 3.0 μm  
25.0 ± 1.5 μm  
395.0 ± 15.0 μm  
≤ 2.00 μm  
≤ 0.5 %  
≥ 100 kpsi (0.7 GN/m<sup>2</sup>)

These precision matched fibers are included in our precision matched sets - see PLMA-YDF-25/250-M and LMA YDF-25/250-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.



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.

# Low Index Specialty Multimode Beam Delivery Fibers



Nufern's passive, Germanium-doped, low NA specialty beam delivery fibers are designed to complement standard Nufern Ytterbium-doped fibers such as LMA-YDF-20/400-M, LMA-YDF-25/250-M and LMA-YDF-30/250-M. These Germanium-doped fibers are available with a high 0.11 NA and 25 micron core, in both 250 and 400 micron form factors. These fibers can be spliced with low losses to the 0.06 NA fibers and ensure good beam stability as the low power is delivered to the work piece. Both offerings have NuCOAT-FA™ coating technology, which provides excellent reliability at elevated power levels demanded by today's industrial fiber laser applications. As with all Nufern fibers, they are drawn in a clean room and proof-tested to > 100 kpsi, allowing them to carry high powers for a long, worry-free lifetime.

## Typical Applications

- Beam Delivery for CW & Pulsed Lasers
- Fiber Coupled Isolators
- Military, Industrial and Medical

## Features & Benefits

- Complimentary high NA passive fibers — ensures continuation of excellent beam quality
- Exceptional geometric uniformity and core/clad concentricity — Ease of splicing to active fibers
- NuCOAT-FA™ coating technology — provides an extended operating life at high power levels
- Proof-tested to > 100 kpsi — an industry requirement for long term reliability.

## Optical Specifications

Operating Wavelength  
Core NA  
First Cladding NA (5%)  
Cladding Attenuation

### BD-G25/250-11FA

800 – 2100 nm  
0.110 ± 0.010  
≥ 0.460  
≤ 15.0 dB/km @ 1095 nm

### BD-G25/400-11FA

800 – 2100 nm  
0.110 ± 0.010  
≥ 0.460  
≤ 15.0 dB/km @ 1095 nm

## Geometrical & Mechanical Specifications

Cladding Diameter  
Core Diameter  
Coating Diameter  
Core/Clad Offset  
Clad Non-Circularity  
Coating Material  
Proof-test Level

250.0 ± 3.0 μm  
25.0 ± 1.5 μm  
395.0 ± 15.0 μm  
≤ 2.00 μm  
≤ 0.5 %  
Low Index Acrylate  
≥ 100 kpsi (0.7 GN/m<sup>2</sup>)

400.0 ± 5.0 μm  
25.0 ± 1.5 μm  
550.0 ± 15.0 μm  
≤ 2.00 μm  
≤ 0.5 %  
Low Index Acrylate  
≥ 100 kpsi (0.7 GN/m<sup>2</sup>)



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](mailto:info@nufern.com) • [www.nufern.com](http://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.