
FIBER SOLUTIONS
FOR FIBER
LASERS
APPLICATIONS

CorActive



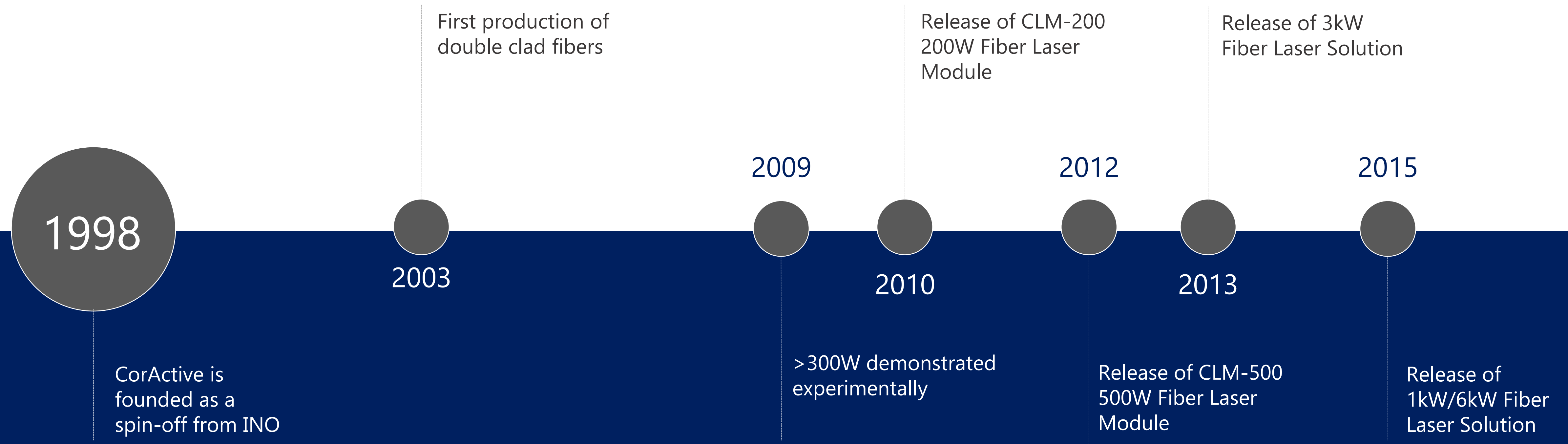


OUR MISSION

“Empower our clients to become and remain market leaders by designing & manufacturing cost-effective, innovative solutions based on our advanced Specialty Optical Fiber technologies”

ABOUT US

MORE THAN 10 YEARS EXPERIENCE IN HIGH-POWER FIBER LASER



ABOUT US

WORLDWIDE PRESENCE



ABOUT US

DIVERSIFIED CUSTOMER BASE



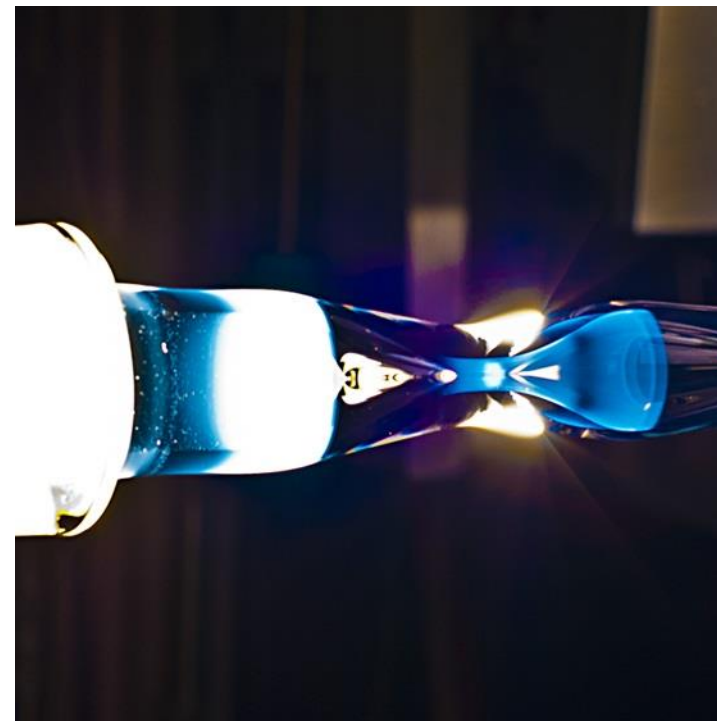
SALES&CUSTOMERS

- Strong customer base
- Worldwide presence in diversified markets
- SMB's to Fortune 500 customers.
- More than 95% of sales are for export



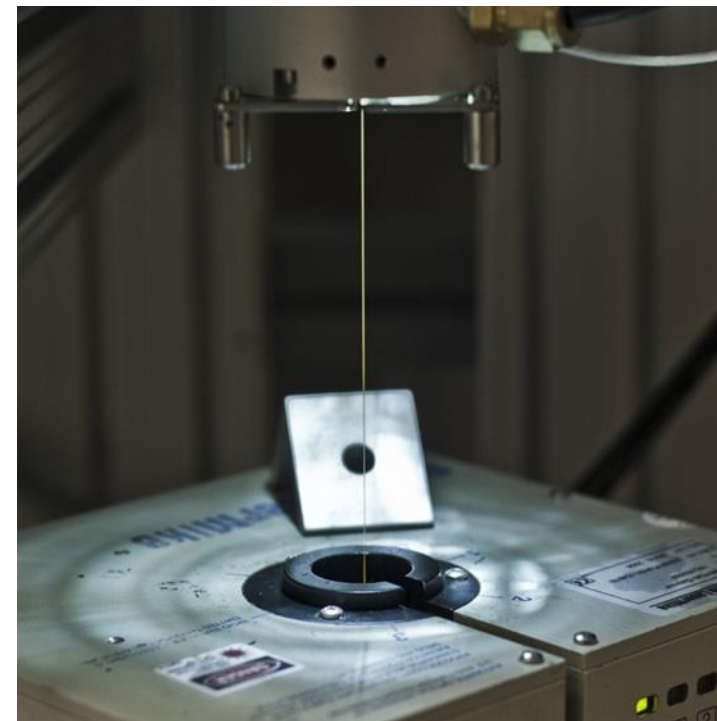
ABOUT US

VERTICALLY INTEGRATED OEM MODULE MANUFACTURING



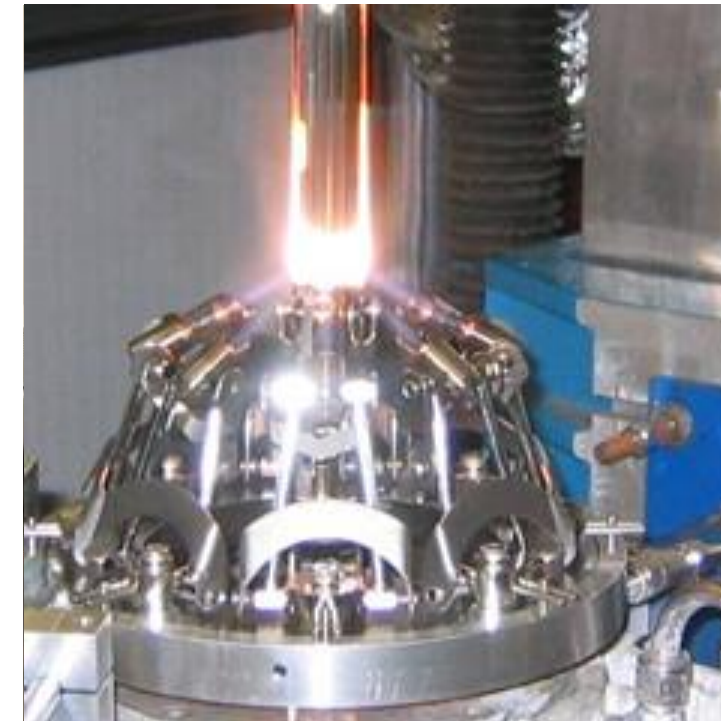
GLASS PREFORM

CorActive produces its own glass preform to ensure the best control of the optical fiber quality and performances and to meet the stringent requirements of high power fiber laser applications



FIBER DRAW

Glass preforms are drawn on CorActive draw tower facilities that feature state-of-the-art control and measurement equipment to guarantee the best optical fiber quality



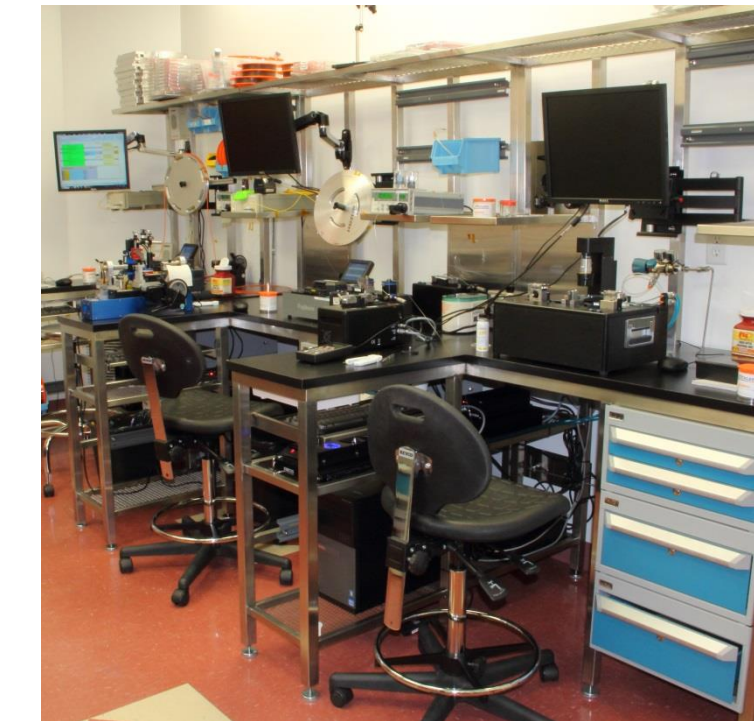
GLASS PROCESSING

Preforms are processed internally to meet the specific form factors required for our diversified range of products



COMPONENTS

CorActive produces all the passive components used inside its OEM fiber laser modules in a Class 10 000 clean room



ASSEMBLY

CorActive OEM fiber laser modules are assembled by highly trained personnel into its cutting-edge production facilities

ABOUT US

MARKET SERVED



Telecom Solutions

CorActive offers a diversified portfolio of specialty fiber products for the component and equipment/system manufacturers in the telecommunications market.



Fiber Laser Solutions

CorActive offers one of the most extensive selection of active and passive fibers in the industry. CorActive specialty optical fibers are specifically designed to meet the needs of the high-power laser and amplifier market. CorActive offers several models of Yb, Er, Er/Yb, and Tm-doped active fibers (PM and non-PM).



Mid-IR Solutions

CorActive delivers a full range of Infrared Transmission (IRT) optical fibers to address beam delivery requirements in the mid-IR region. CorActive also offers a new line of mid-IR fiber lasers.



**CORACTIVE SOLUTIONS
FOR MOPA / HIGH PEAK POWER
FIBER LASERS**

FIBER LASERS FOR MATERIALS PROCESSING

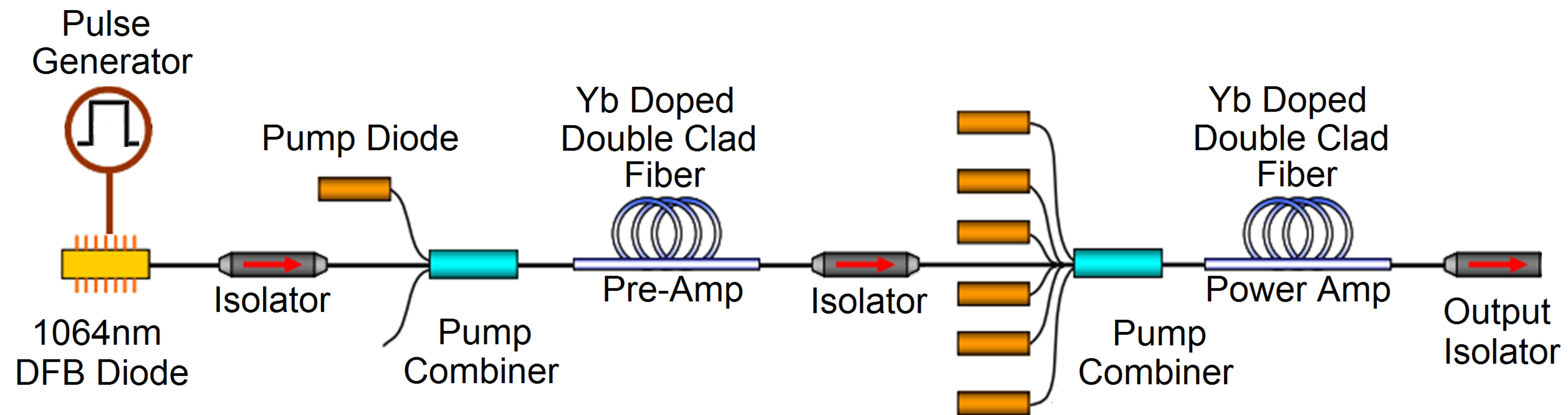
EMERGING APPLICATIONS REQUIRING HIGH PEAK POWERS/HIGH PULSE ENERGIES

- ❑ The emergence of ytterbium fiber lasers is one of the most significant advancements in materials processing applications. The all-fiber structure is largely responsible for the reliability and ruggedness of these lasers, which accounts for their rapid growth.
- ❑ New emerging applications such as deep engraving, trimming and micro welding & cutting, stress the needs for fiber laser with higher peak power and pulse energies.
- ❑ MOPA type fiber laser are particularly well suited for these emerging applications due to their high versatility

HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

MOPA FIBER LASER DESCRIPTION AND TYPICAL ARCHITECTURE

Directly modulated MOPA (DM-MOPA) fiber lasers can operate at repetition rates up to 500kHz at nanosecond pulse widths. Their advantages partly lie in their flexibility: it is easy to modify not only the pulse repetition rate but also the pulse duration and shape, and of the course the pulse energy.



HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

DESIGN CHALLENGES

Designing high peak power, high energy fiber lasers remains challenging:

Nonlinear limitations: high peak powers cause SRS and SPM effects; for narrow linewidth SBS also needs to be considered.

To mitigate nonlinear effects:

Higher absorption, larger core area, or higher saturation energy fibers are needed

BUT

High beam quality is still desired!

HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

CORACTIVE PHOSPHOSILICATE FIBER PRODUCT LINE

To meet the requirements of high peak power/high energy fibers lasers, CorActive offers several phosphosilicate glass fibers that are particularly well suited for MOPA fiber lasers in such applications

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @915nm (dB/m)	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-YB-7/128-FHA	7.0 ± 1.0	128 ± 3	0.19 ± 0.02	1.3 ± 0.3	DCF-UN-6/125-14	HI 1060
DCF-YB-8/128P-FA	8.0 ± 1.0	128 ± 3	0.10 ± 0.02	1.8 ± 0.3	DCF-UN-8/125-10	SCF-UN-8/125-10
DCF-YB-12/128P-FA	12.0 ± 1.0	128 ± 3	0.08 ± 0.01	3.0 ± 0.5	DCF-UN-10/125-080	SCF-UN-10/125-080
DCF-YB-20/128P-FAC	20.0 ± 2.0	128 ± 3	0.08 ± 0.01	5.0 ± 0.5	DCF-UN-20/125-100	SCF-UN-20/125-100
DCF-YB-20/128P-FAS*	20.0 ± 2.0	128 ± 3	0.08 ± 0.01	9.0 ± 1.0	DCF-UN-20/125-100	SCF-UN-20/125-100
DCF-YB-30/250P-FAC*	30.0 ± 2.0	250 ± 5	0.08 ± 0.01	4.00 ± 0.75	DCF-UN-30/250-070	SCF-UN-30/250-070
DCF-YB-50/400P-FAC*	50.0 ± 3.0	400 ± 5	0.08 ± 0.01	4.50 ± 0.75	DCF-UN-50/400-12	SCF-UN-50/400-12

* Coming soon. Specifications are preliminary

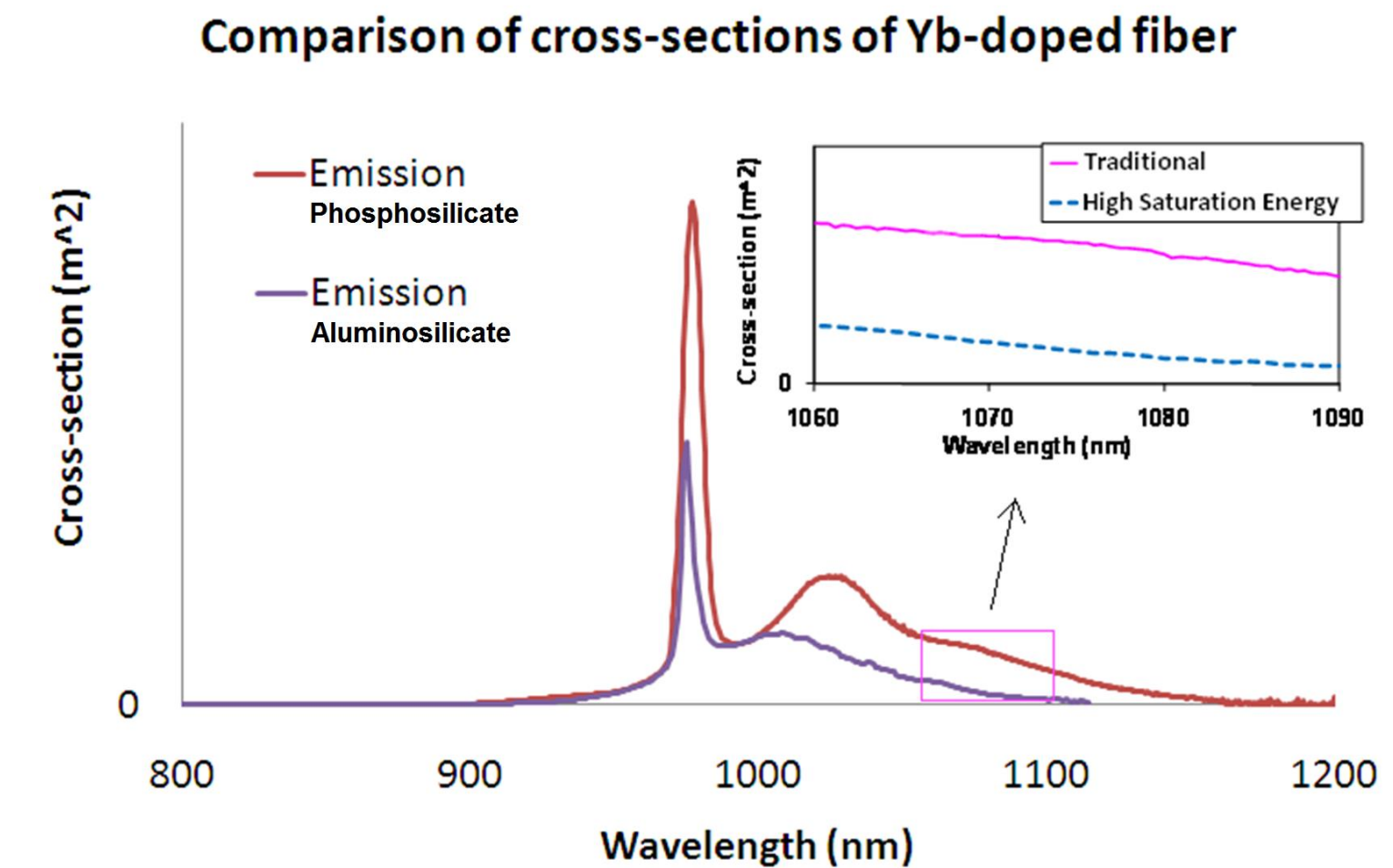
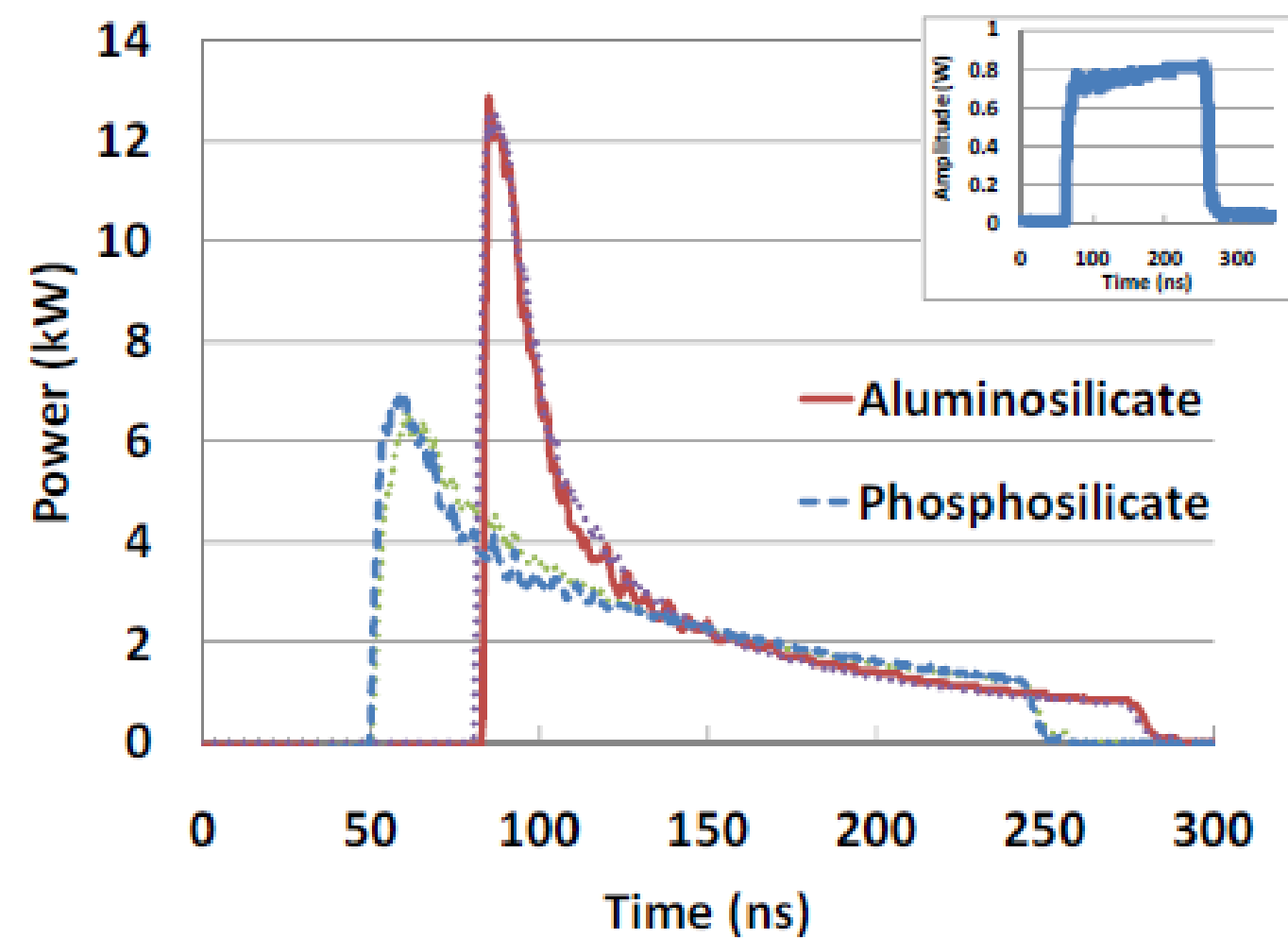
HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

PHOSPHOSILICATE FIBER ADVANTAGES

1 High Saturation Energy

Phosphosilicate glass fibers feature a saturation energy that is twice as much as standard aluminosilicate glass fibers leading to higher nonlinear effect threshold and lower pulse deformation

$$E_{sat} = \frac{(hc_o / \lambda_o) A}{(\sigma_e + \sigma_a) \Gamma}$$



HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

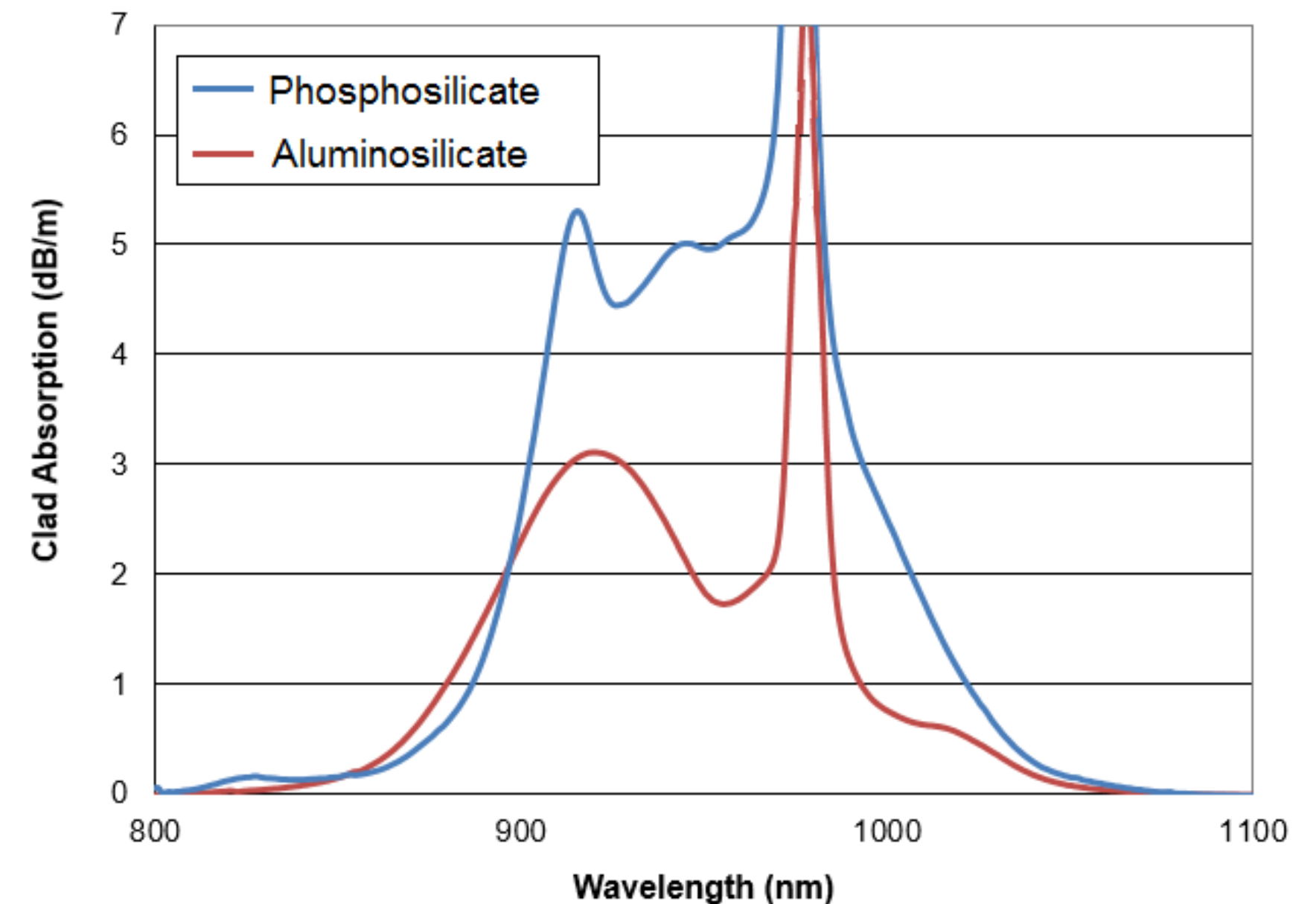
PHOSPHOSILICATE FIBER ADVANTAGES

2 | High Absorption

Phosphosilicate glass fibers feature high clad absorption, much higher than standard aluminosilicate glass fibers.

This high absorption allows shorter fiber length to be used thereby reducing nonlinear effect threshold.

Peak clad absorption near 976nm is even higher at more than 6x the absorption near 915nm, compare to about 4-5x with standard aluminosilicate glass fibers.



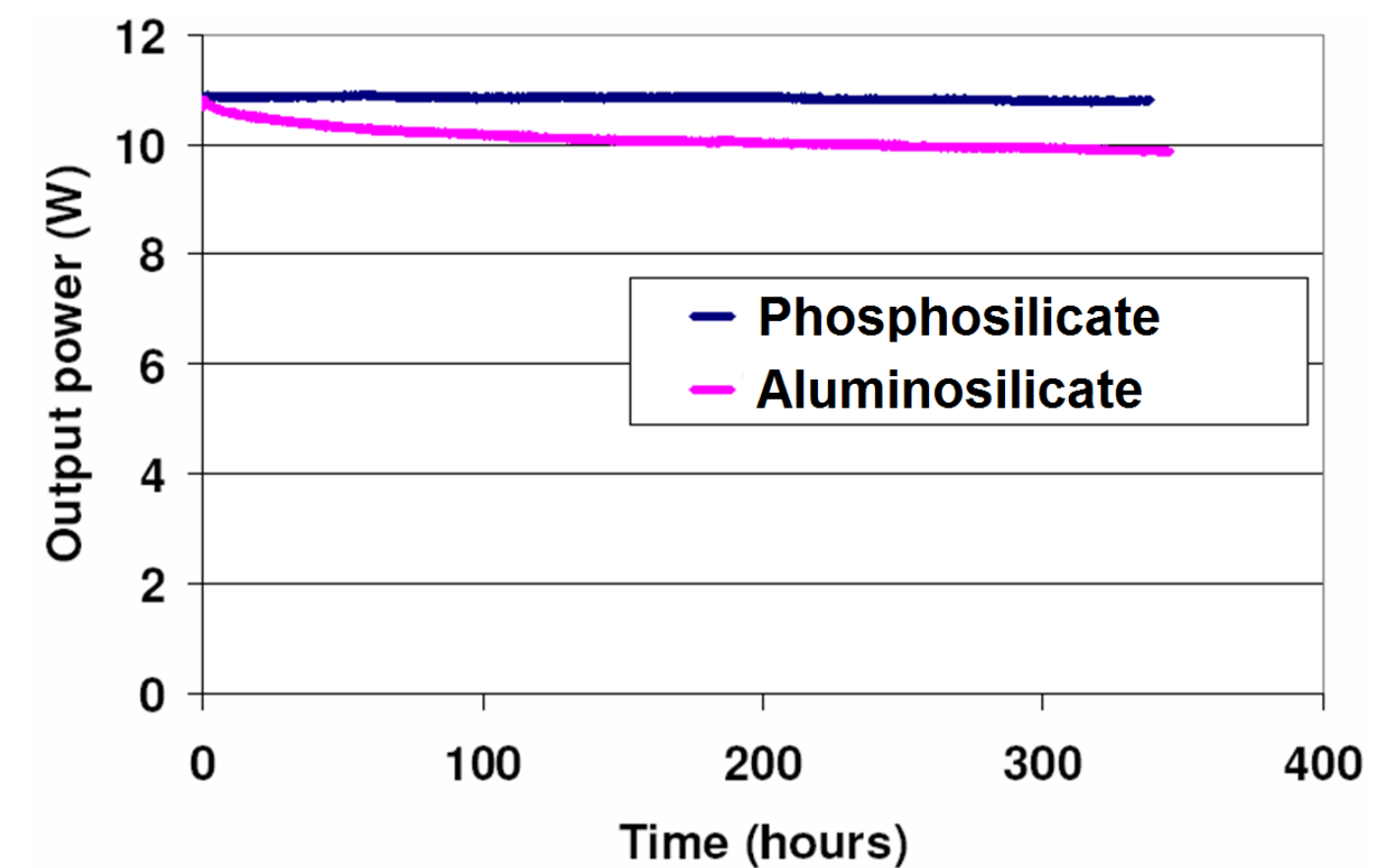
HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

PHOSPHOSILICATE FIBER ADVANTAGES

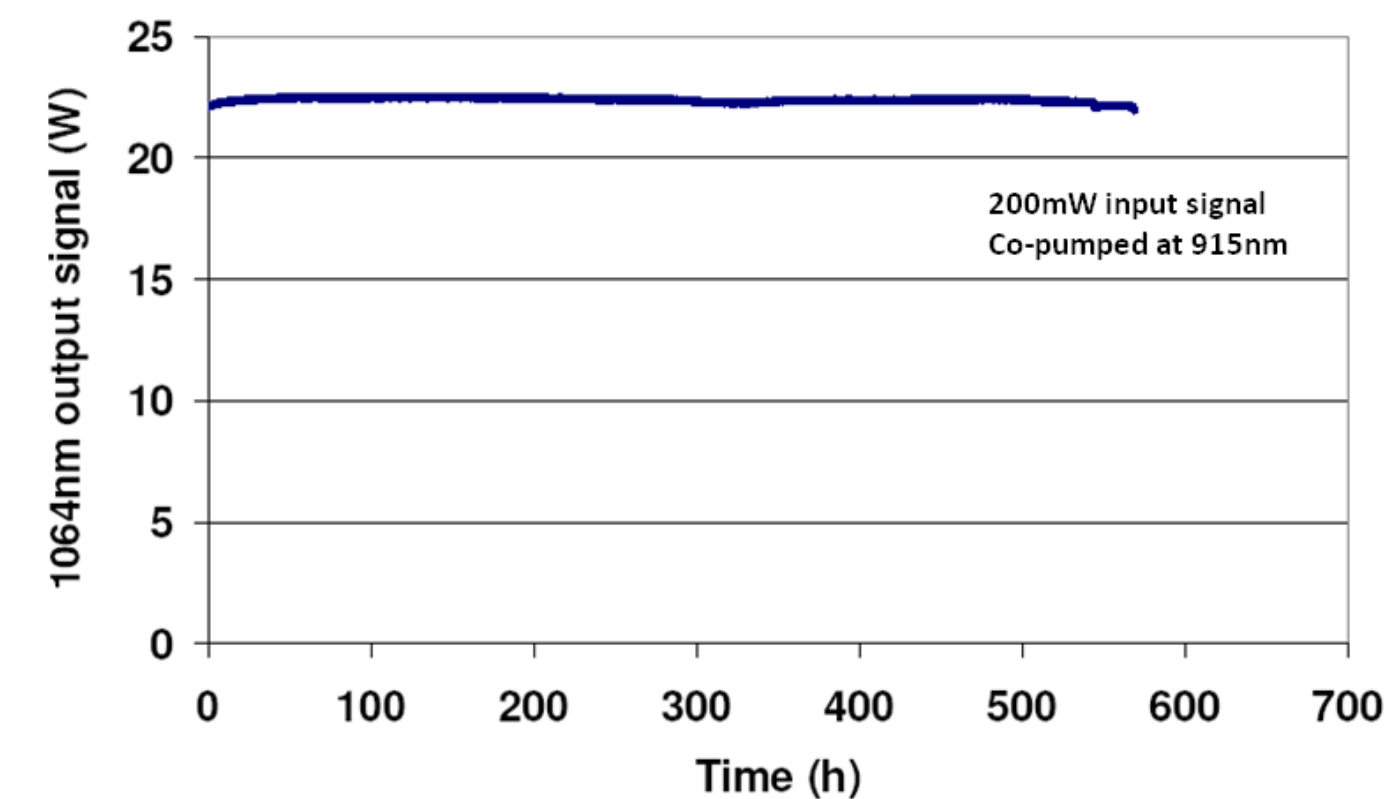
3 | Stable Long-term Output Power

Phosphosilicate glass fibers are truly photodarkening free.

Although aluminosilicate glass fibers have improved considerably over the next few years, they still demonstrate some residual photodarkening effects which can be detrimental to the performance and reliability of the lasers in some applications.



DCF-YB-20/128P-FA at 22W/30kHz/200ns



HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

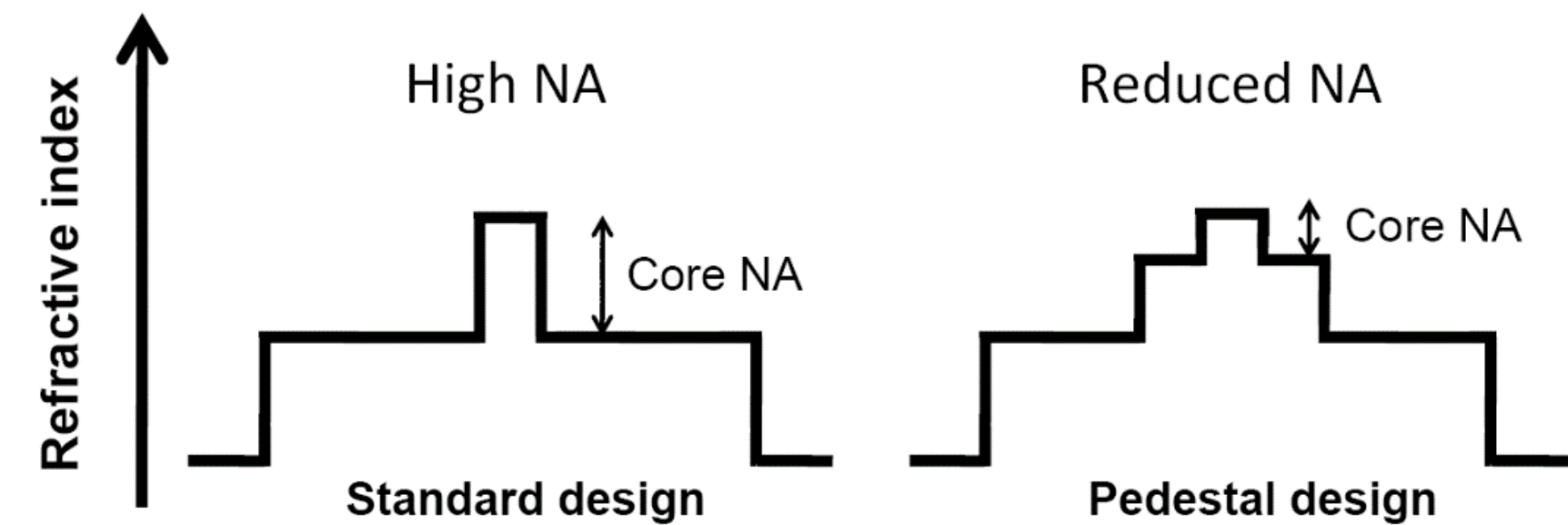
PHOSPHOSILICATE FIBER ADVANTAGES

4 | Excellent Beam Quality

Phosphosilicate glass fibers have inherently high numerical apertures that are detrimental to the beam quality.

The use of a pedestal design allows to lower the effective numerical aperture

Most of CorActive phosphosilicate fibers have a pedestal design for high beam quality.



HIGH PEAK POWER/HIGH ENERGY FIBER LASERS

OUR PRODUCT LINE – ADVANTAGES AND TYPICAL APPLICATIONS

Model	Advantages	Typical Applications
DCF-YB-7/128-FHA	Matched to HI1060	Pre-Amplifier Stage
DCF-YB-8/128P-FA	Strictly Singlemode, High Absorption	Pre-Amplifier Stage
DCF-YB-12/128P-FA	High Absorption, Good Beam Quality	Power Amplifier, Singlemode Operation, >0.5mJ/20W
DCF-YB-20/128P-FAC	High Absorption	Power Amplifier, 1mJ/20W
DCF-YB-20/128P-FAS*	Very High Absorption	Power Amplifier, > 100kW peak power
DCF-YB-30/250P-FAC*	High Absorption	Power Amplifier, > 250kW peak power
DCF-YB-50/400P-FAC*	High Absorption	Power Amplifier, > 500kW peak power

* Coming soon. Specifications are preliminary

Reference:

Morasse, Bertrand; Plourde, Estéban; Realization and optimization of a 1 ns pulsewidth multi-stage 250 kW peak power monolithic Yb doped fiber amplifier at 1064 nm; PROC. SPIE, PHOTONICS WEST 2017, LASE, FIBER LASERS XIV: TECHNOLOGY AND SYSTEMS
http://coractive.com/fileadmin/documents_publics/Publications/Paper-250kW-1ns_PW-20170201.pdf



CORACTIVE SOLUTIONS FOR MARKING&ENGRAVING FIBER LASERS

MARKING&ENGRAVING FIBER LASERS

GENERATION E FIBER - OVERVIEW

GenE Production-Grade Fibers

CorActive offers its Generation E fibers for marking&engraving fiber lasers. Several enhancements to the manufacturing process were introduced to get optimal reproducibility and optical performances to meet the requirements of today's high-volume fiber laser production. CorActive Generation E fibers are available in different models with matched passive single-clad and double-clad fibers..

CorActive's new Generation E production-grade fibers offer many advantages that make them the ideal solution for high-volume fiber laser production environment.

- Outstanding uniformity and batch-to-batch consistency
- Enhanced resistance to back-reflection
- High effective pump absorption
- Wide and flattened absorption spectrum
- Excellent and repeatable beam quality
- High photodarkening resistance performance at high power ensuring stable long-term operation
- CorACLAD Hi-Rel low-index polymer coating
- Compatible with industry standards

Typical Applications

- Lasers for marking and engraving
- Ideal solution for large volume customers

MARKING&ENGRAVING FIBER LASERS

TYPICAL REQUIREMENTS

To meet the requirements of fibers lasers for marking and engraving applications, CorActive offers several E generation ytterbium doped fibers that are particularly well suited for pulsed fiber lasers in such applications. The Yb Phosphosilicate fibers can also be used as a replacement to these fibers.

Model	Core Diameter/ MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @ 915nm (dB/m)	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-YB-10/128E	11.0 \pm 0.5	128 \pm 3	0.085 \pm 0.005	1.30 \pm 0.15	DCF-UN-10/125-08	SCF-UN-10/125-08
DCF-YB-20/128E	20.0 \pm 1.0	128 \pm 3	0.080 \pm 0.005	3.0 \pm 0.3	DCF-UN-20/125-080	SCF-UN-20/125-08
DCF-YB-30/250E*	30.0 \pm 2.0	250 \pm 5	0.062 \pm 0.005	2.0 \pm 0.2	DCF-UN-30/250-065	SCF-UN-30/250-065

* Coming soon. Specifications are preliminary

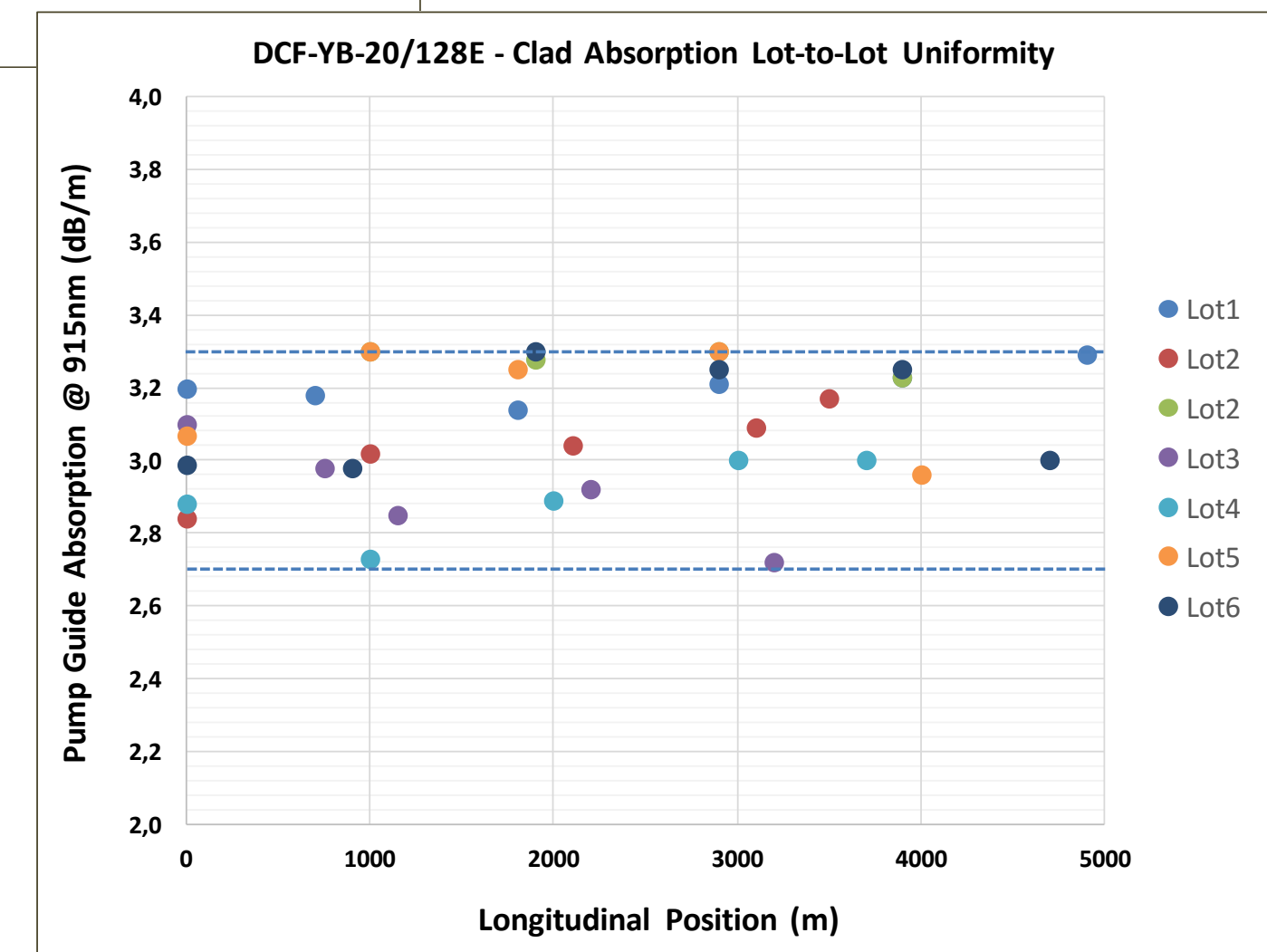
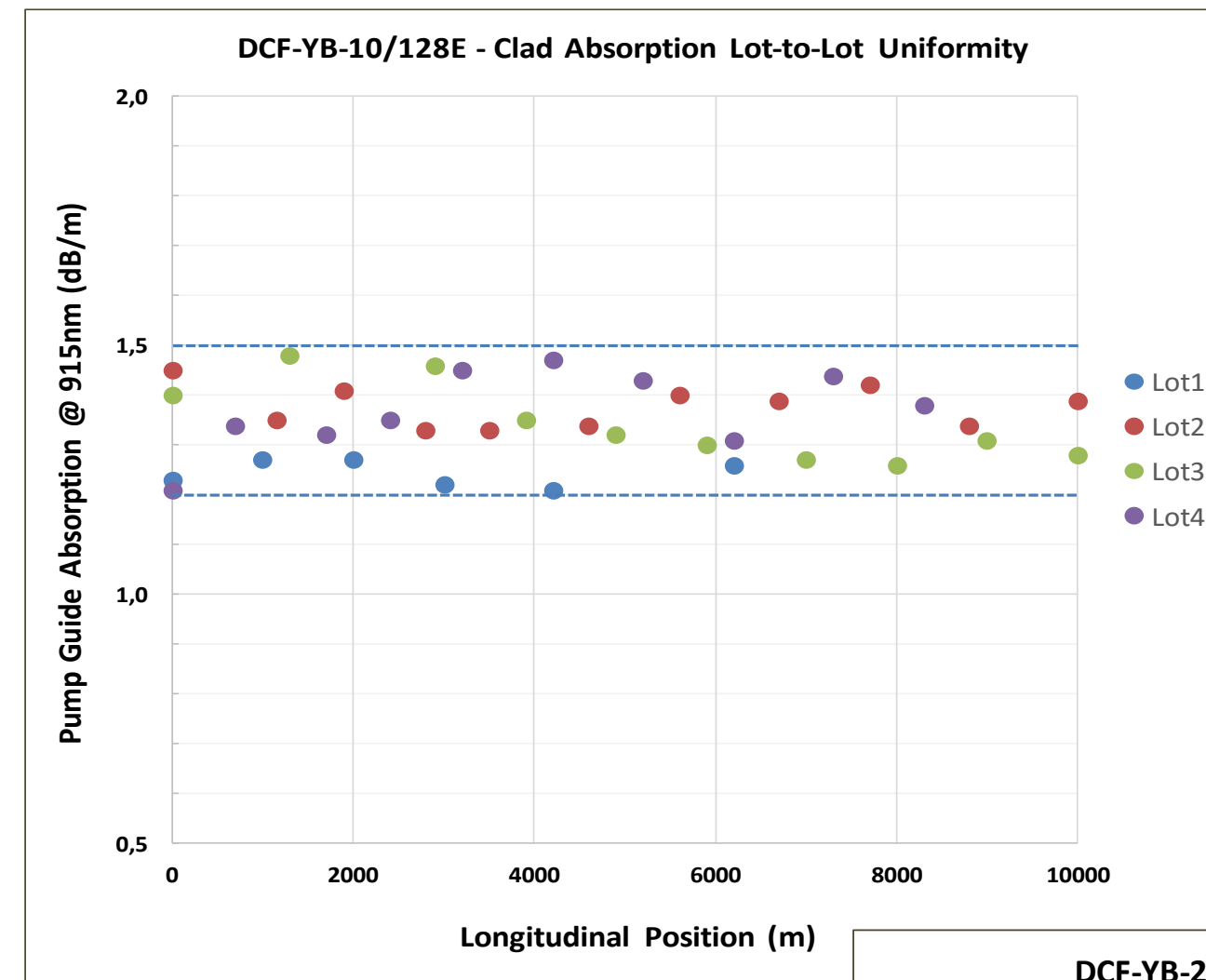
FIBER LASER SOLUTION – GENERATION E FIBER

PERFORMANCES – BATCH TO BATCH UNIFORMITY



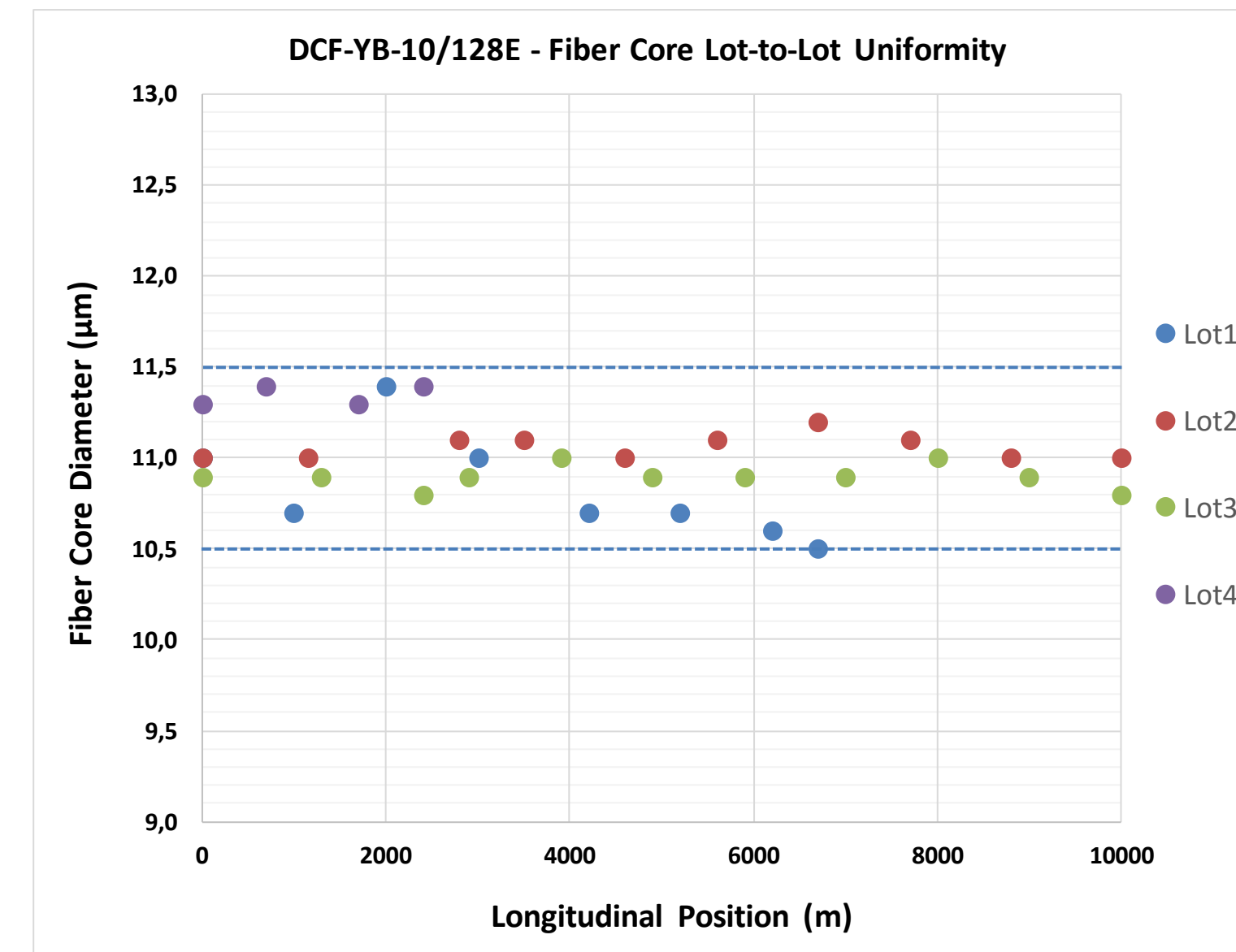
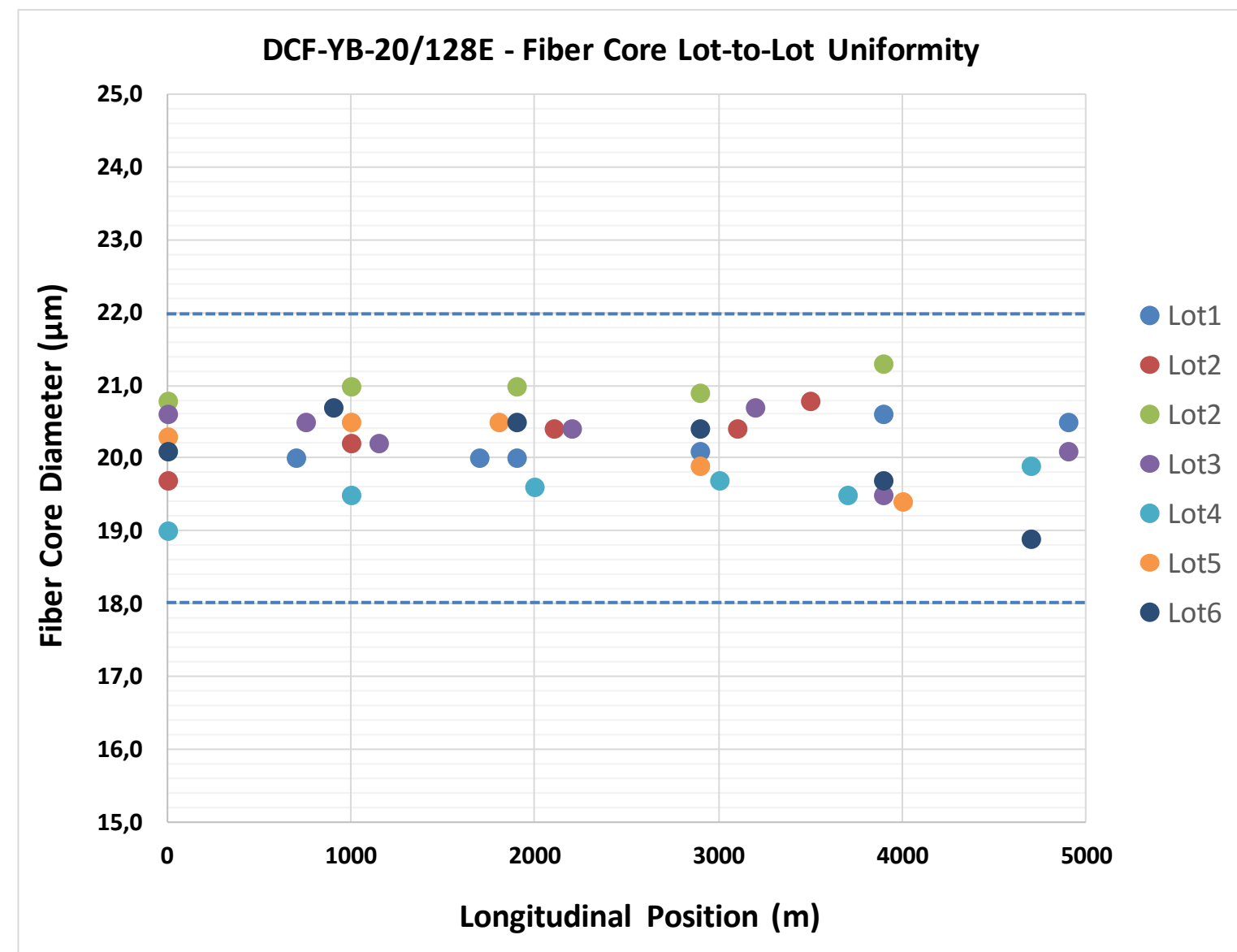
Outstanding uniformity and batch-to-batch consistency

CorActive Generation E fiber presents outstanding uniformity within the same fiber lot and consistent performances to make it ideal for high-volume fiber laser production environment with optimal reproducibility.



FIBER LASER SOLUTION – GENERATION E FIBER

PERFORMANCES – BATCH TO BATCH UNIFORMITY

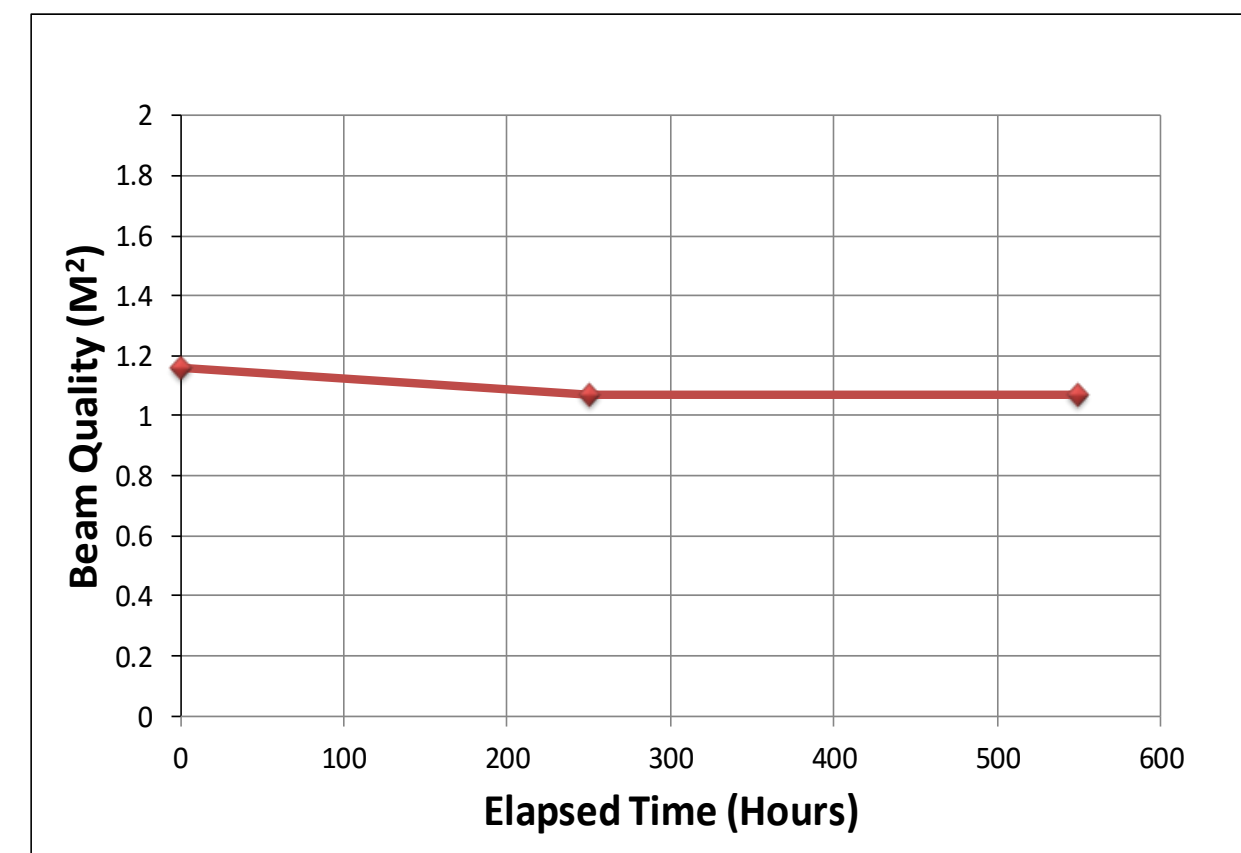
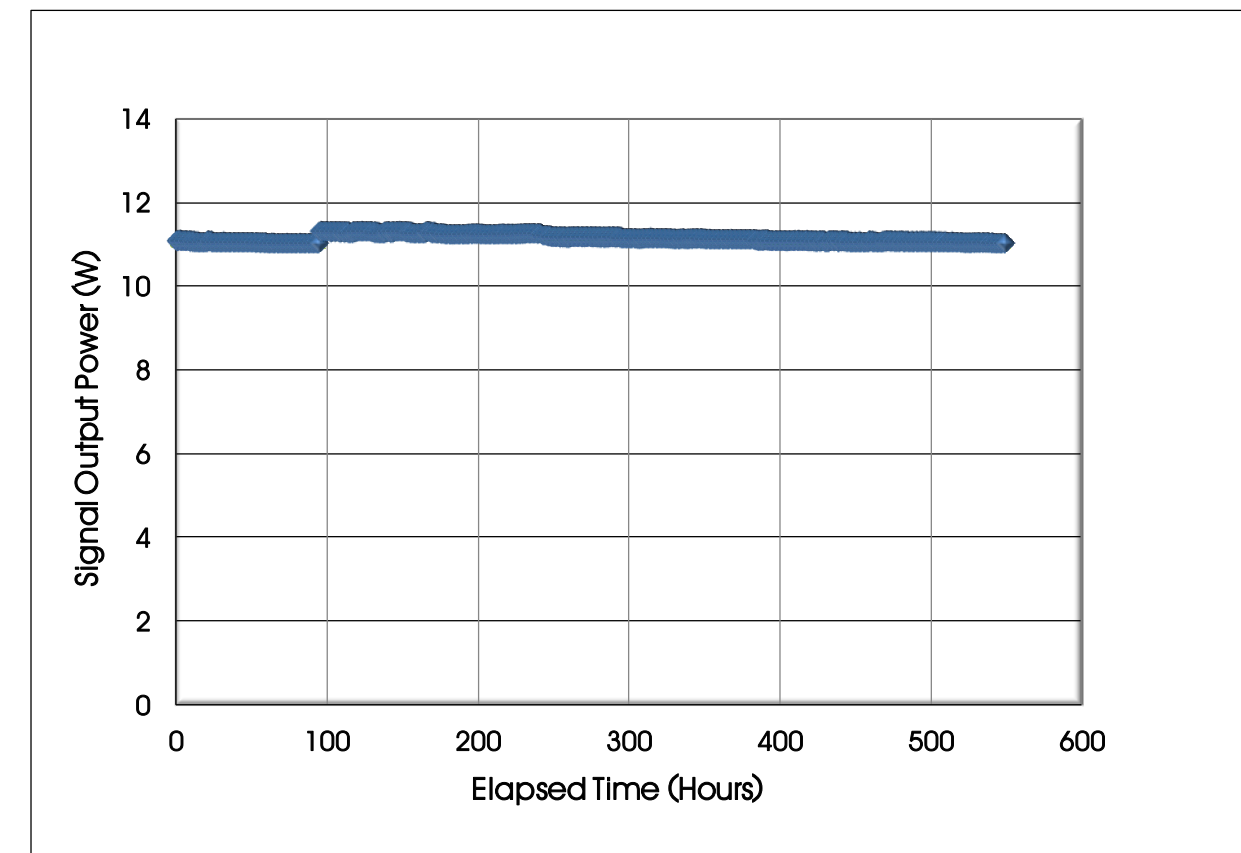


FIBER LASER SOLUTION – GENERATION E FIBER

PERFORMANCES – LONG-TERM STABILITY

Excellent long-term stability

CorActive Generation E fiber presents excellent long-term stability due to its glass matrix. The results illustrated above were measured with the DCF-UN-10/125 fiber as input fiber and with 15dB of DCF-YB-20/128E fiber. The pulse conditions were set at 20kHz/500ns.



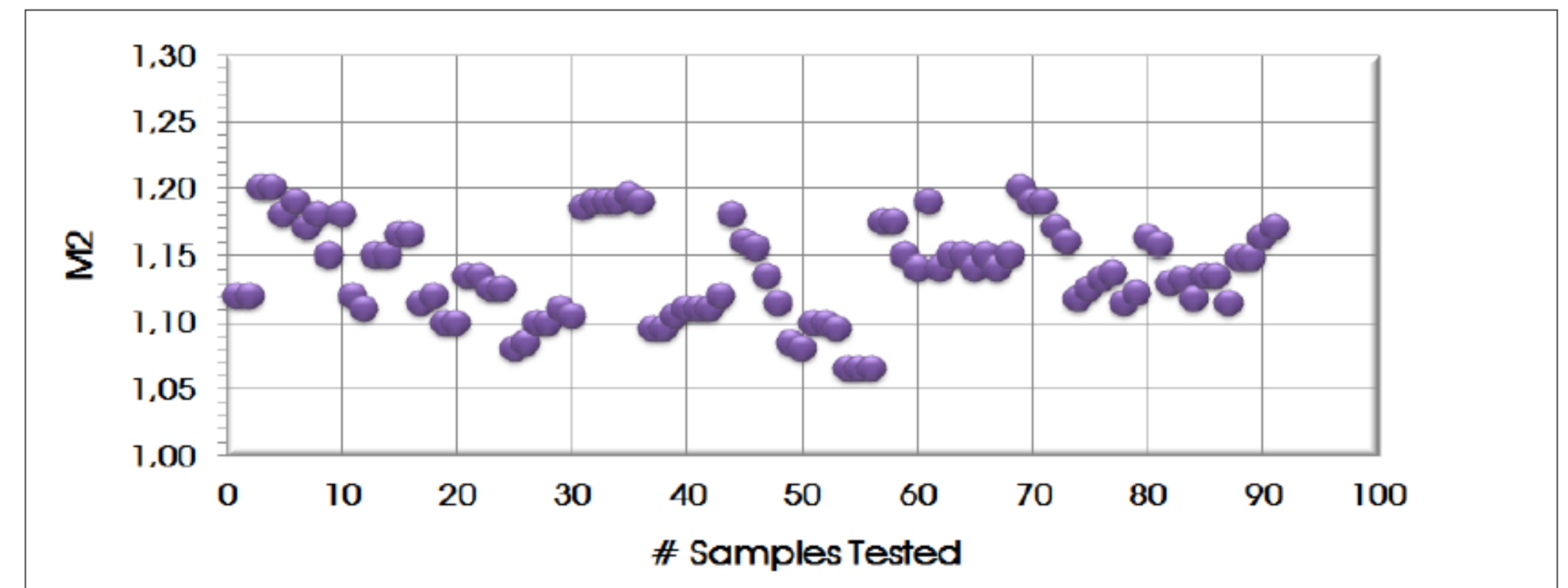
FIBER LASER SOLUTION – GENERATION E FIBER

PERFORMANCES – BEAM QUALITY



Excellent and repeatable beam quality

As an excellent beam quality is required for laser marking and engraving applications, the repeatability from one product to another is paramount for end-users. CorActive Gen E fibers ensure repeatable M^2 values from one lot to the other and throughout the lifetime of the fiber laser.



CORACTIVE FIBER SOLUTIONS FOR ULTRAFAST LASERS

FIBERS FOR ULTRAFAST LASERS & AMPLIFIERS

OVERVIEW

- ❑ Growing area of photonics with emerging applications as short optical pulses allow the probing of basic physics of light/matter interactions in the sub-picosecond regime.
- ❑ Strong interest in the development of ultrafast fiber laser systems providing high-power femtosecond or picosecond pulses increasingly for use in industrial applications outside of a research laboratory
- ❑ Wide range of applications including materials processing, medical applications, high-frequency instrumentation, scientific applications and various forms of imaging and spectroscopy.
- ❑ As the technology matures, fiber lasers are becoming suitable alternatives to solid-state lasers for many applications

FIBERS FOR ULTRAFAST LASERS & AMPLIFIERS

PRODUCT LINE

To address the ultrafast fiber laser market, CorActive offers several polarization-maintaining optical fibers that are usually required for these applications

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
ER35-7-PM	6.5 ± 0.5	125 ± 2	0.22	35 @ 1530nm	> 1.4E-04	N/A	PM 1550
YB 401-PM	6 ± 1	125 ± 1	0.14 ± 0.02	140 ± 25	≥ 3.0E-04	N/A	PM 980
DCF-EY-6/128-PM	6.5 ± 0.8	128 ± 3	0.20	0.70 ± 0.15	> 1.2E-04	DCF-UN-8/125-14-PM	PM 1550
DCF-EY-10/128-PM	10.0 ± 2.0	128 ± 3	0.20 ± 0.02	2.0 ± 0.5	> 1.4E-04	DCF-UN-8/125-14-PM	PM 1550
DCF-YB-6/128S-PM	6.0 ± 1.0	128 ± 3	0.12 ± 0.01	0.60 ± 0.15	≥ 2.2E-04	DCF-UN-6/125-14-PM	PM 980

An aerial photograph of a small, white and blue aircraft flying over a green, hilly landscape. The aircraft is positioned in the upper left quadrant of the frame. From the underside of the aircraft, a fan of numerous orange laser beams extends downwards, covering a large area of the terrain below. The landscape features rolling hills, a winding road, and several small ponds or lakes. The overall scene is captured from a high-angle perspective, looking down at the aircraft and the terrain it is scanning.

CORACTIVE SOLUTIONS FOR LIDAR APPLICATIONS

FIBER LASER FOR LIDAR APPLICATIONS

ADVANTAGES AND CHALLENGES

- ❑ Fiber lasers systems operating in the so-called “eye-safe” wavelength region offer exceptional advantages for free space applications compared to conventional systems that operates at shorter wavelengths.
- ❑ This wavelength range includes windows of high transparency and strong absorption in the air.
- ❑ For LIDAR applications, fiber lasers are favored for their compactness, efficiency and thermal properties.
- ❑ High peak power is usually desired **BUT is limited due to the generation of nonlinear effects.**
- ❑ **In order to reduce these nonlinear effects, fibers with high absorption or large effective area are wanted but** an excellent beam quality is still required.
- ❑ CorActive offers a wide range of products that fits the requirements of LIDAR applications.

FIBERS FOR 1.5 MICRON LASERS & AMPLIFIERS

ER/YB CO-DOPED FIBERS – SINGLE CLAD PRODUCT LINE

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Core Absorption @1530nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
ER35-7 / ER35-7-PM	6.5 ± 0.5	125 ± 2	0.22	35 ± 5	> 1.4E-04	N/A	N/A
NSP-0106 (SCF-ER60-8/125-12)	8.0 ± 1.0	125.0 ± 0.5	0.12± 0.10	60 ± 10	N/A	N/A	N/A
NSP-0108 (SCF-ER35-10/125-2)	10.0 ± 1.0	125.0 ± 0.5	0.12± 0.10	35 ± 10	N/A	N/A	N/A
NSP-0109 (SCF-ER35-12/125-10)	12.0 ± 1.0	125.0 ± 0.5	0.10± 0.10	35 ± 10	N/A	N/A	N/A

FIBERS FOR LIDAR APPLICATIONS

SINGLE CLAD FIBERS – ADVANTAGES AND TYPICAL APPLICATIONS

Model	Advantages	Typical Applications
ER35-7 / ER35-7-PM	High absorption	Preamplifier stage
NSP-0106 (SCF-ER60-8/125-12)	Very high absorption, low nonlinear threshold, perfectly matched to SMF-28 fiber	Preamplifier stage
NSP-0108 (SCF-ER35-10/125-12)	High efficiency, large effective area, compatible with SMF-28 fiber	Preamplifier stage
NSP-0109 (SCF-ER35-12/125-10)	Very large effective area, compatible with SMF-28 fiber	Preamplifier stage

FIBERS FOR 1.5 MICRON LASERS & AMPLIFIERS

ER/YB CO-DOPED FIBERS – DOUBLE CLAD PRODUCT LINE

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad Absorption @915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-EY-6/128	6.5 ± 0.8	128 ± 3	0.20	0.90 ± 0.15	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-6/128-PM	6.5 ± 0.8	128 ± 3	0.20	0.70 ± 0.15	> 1.2E-04	DCF-UN-8/125-14-PM	
DCF-EY-10/128H	10.0 ± 1.0	128 ± 3	0.20 ± 0.02	> 2.0	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-10/128-PM	10.0 ± 2.0	128 ± 3	0.20 ± 0.02	2.0 ± 0.5	> 1.4E-04	DCF-UN-8/125-14-PM	
DCF-EY-12/130H	12.0 ± 1.0	130 ± 3	0.20 ± 0.02	3.2 ± 0.6	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-16/128	16.0 ± 1.5	128 ± 3	0.16 ± 0.02	5.5 ± 1.5	N/A	DCF-UN-16/125-16	SCF-UN-16/125-16
DCF-EY-16/250P	16.0 ± 1.0	250 ± 5	0.11 ± 0.01	1.75 ± 0.25	N/A	DCF-UN-15/250-10	SCF-UN-15/250-10
NSP-0100 (DCF-EY-8/128P)	8.0 ± 1.0	128 ± 2	0.12 ± 0.01	1.50 ± 0.5	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
NSP-0101 (DCF-EY-11/128-16)	11.0 ± 1.0	128 ± 3	0.16 ± 0.01	2.5 ± 1.0	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
NSP-0102 (DCF-EY-25/250P)	25.0 ± 2.5	250 ± 5	0.10 ± 0.01	5.0 ± 1.0	N/A	DCF-UN-25/250-10	SCF-UN-25/250-10

FIBERS FOR LIDAR APPLICATIONS

DOUBLE CLAD FIBERS – ADVANTAGES AND TYPICAL APPLICATIONS

Model	Advantages	Typical Applications
DCF-EY-6/128-PM	Matched to PM 1550 type fibers	Low power CW/pulsed laser design
DCF-EY-10/128H	High absorption, High efficiency, good beam quality	>5W/Up to 5kW
DCF-EY-10/128-PM	High absorption, High efficiency, good beam quality	>5W/Up to 5kW
DCF-EY-12/130H	High pump absorption, good beam quality	Mid/High peak power pulsed laser design >5W/>5kW
DCF-EY-16/128	Very high pump absorption	Mid/High peak power pulsed laser design
DCF-EY-16/250P	High Efficiency, good beam quality	>10W/>10kW, Power Amplifier stage design
NSP-0100 (DCF-EY-8/128P)	Very high efficiency (slope >45%), compatible with SMF-28 fiber	Mid/High peak power pulsed laser design (up to 5W average power, Up to 5kW peak power)
NSP-0101 (DCF-EY-11/128-16)	High efficiency (slope > 40%), low 1 μ m ASE	Mid/High peak power pulsed laser design
NSP-0102 (DCF-EY-25/250P)	High Absorption, low nonlinear threshold	Pulsed Laser: Up to 10W average power, Up to 15kW peak power

ERBIUM / YTTERBIUM CO-DOPED FIBERS FOR PULSED APPLICATIONS

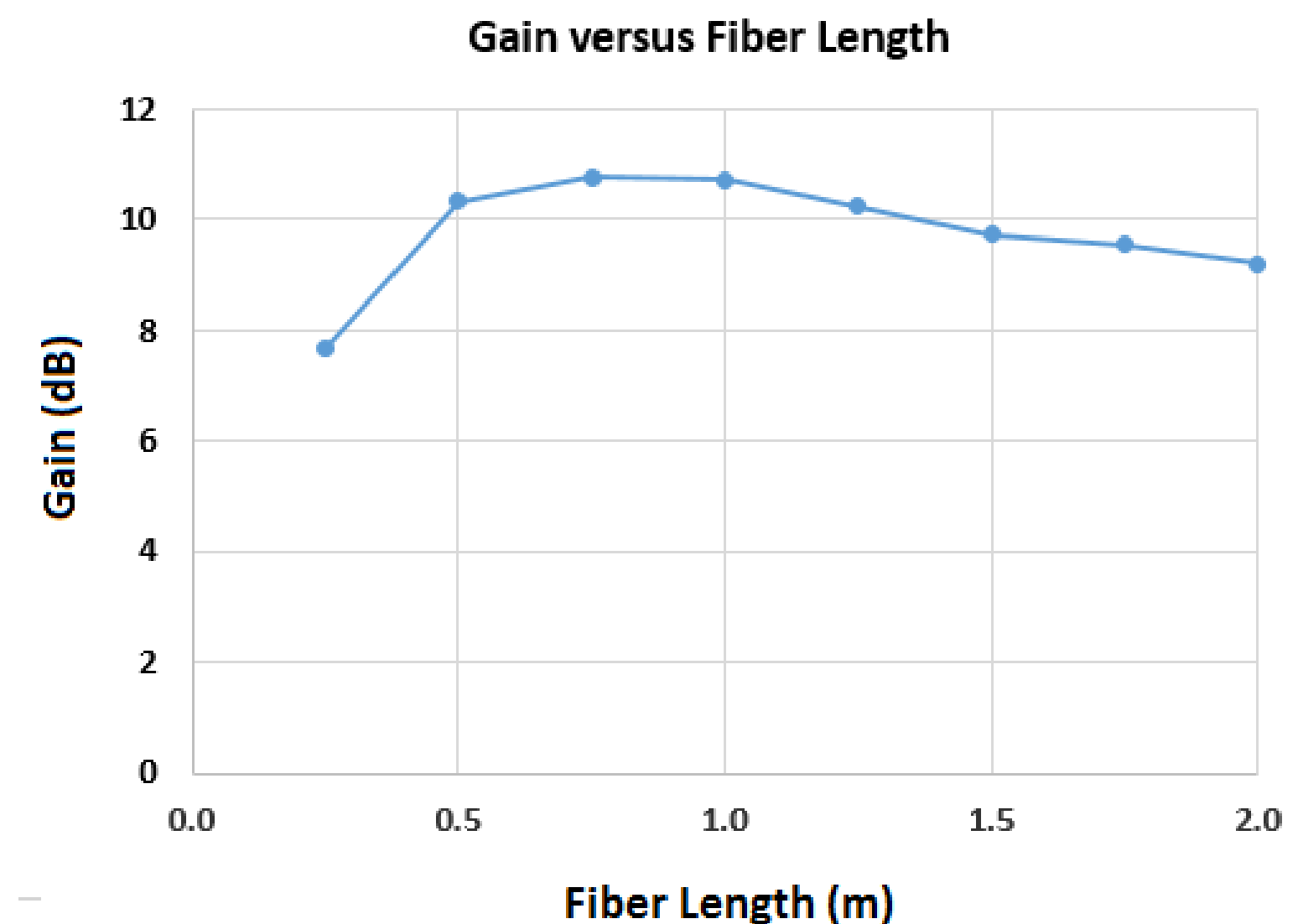
NSP-0106 – SCF-ER60-8/125-12

1 | ADVANTAGES

- Very High Absorption
- High Conversion Efficiency
- Very Short Fiber Lengths for Reduced Nonlinear Effects
- Matched to Standard Singlemode Fiber (SMF-28)

2 | TYPICAL APPLICATIONS

- Oscillator/Pre-Amplifier Stage
- LIDAR
- Ultrashort Pulse Laser/Amplifier



ERBIUM / YTTERBIUM CO-DOPED FIBERS FOR PULSED APPLICATIONS

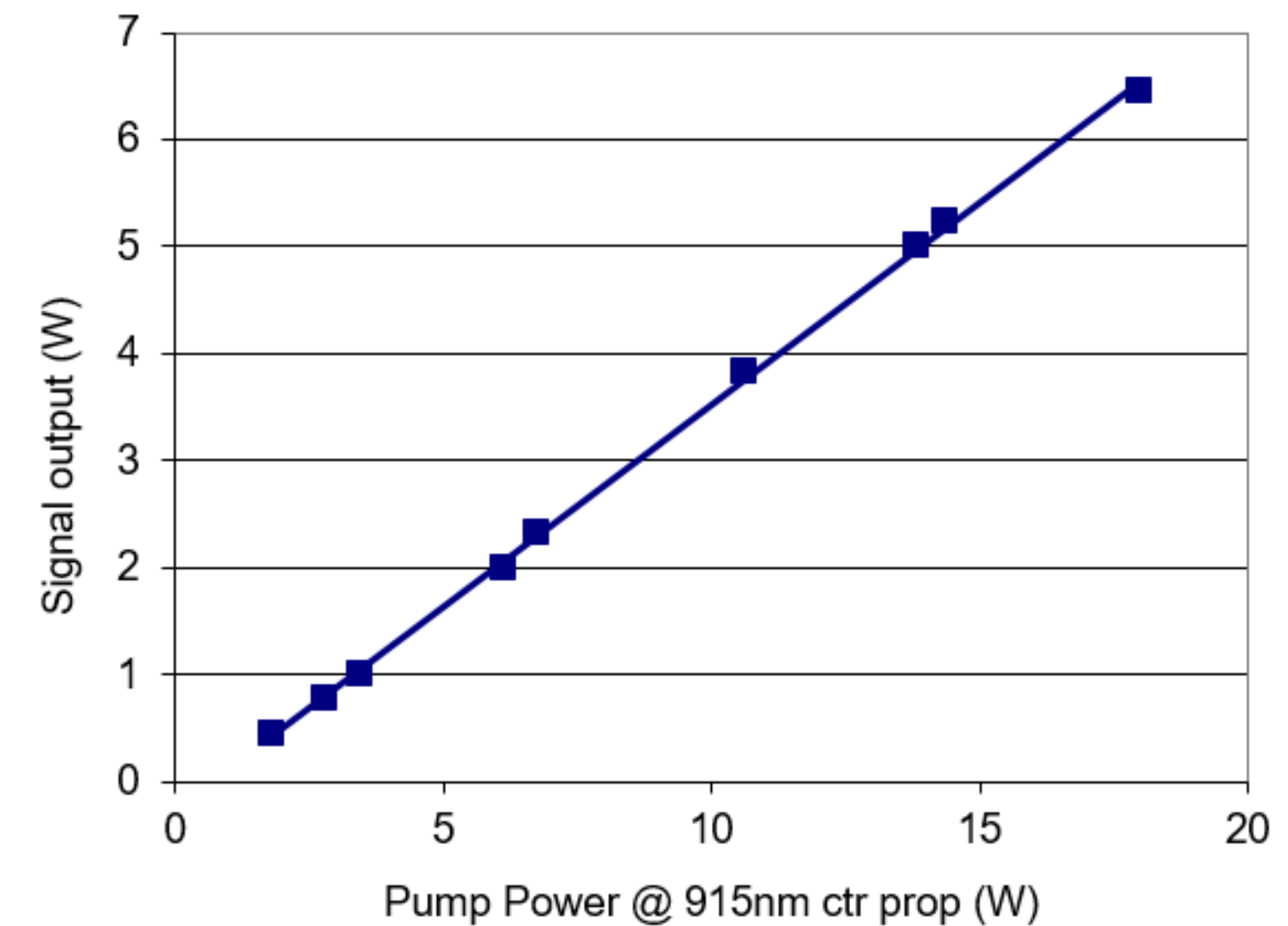
DCF-EY-12/130

1 | ADVANTAGES

- High Absorption
- High Conversion Efficiency
- Good Beam Quality
- Low Splice Losses with Standard Singlemode Fiber (SMF-28)

2 | TYPICAL APPLICATIONS

- Power Amplifier Stage
- >5W/>5kW peak power
- LIDAR
- Ultrashort Pulse Laser/Amplifier



ERBIUM / YTTERBIUM CO-DOPED FIBERS FOR PULSED APPLICATIONS

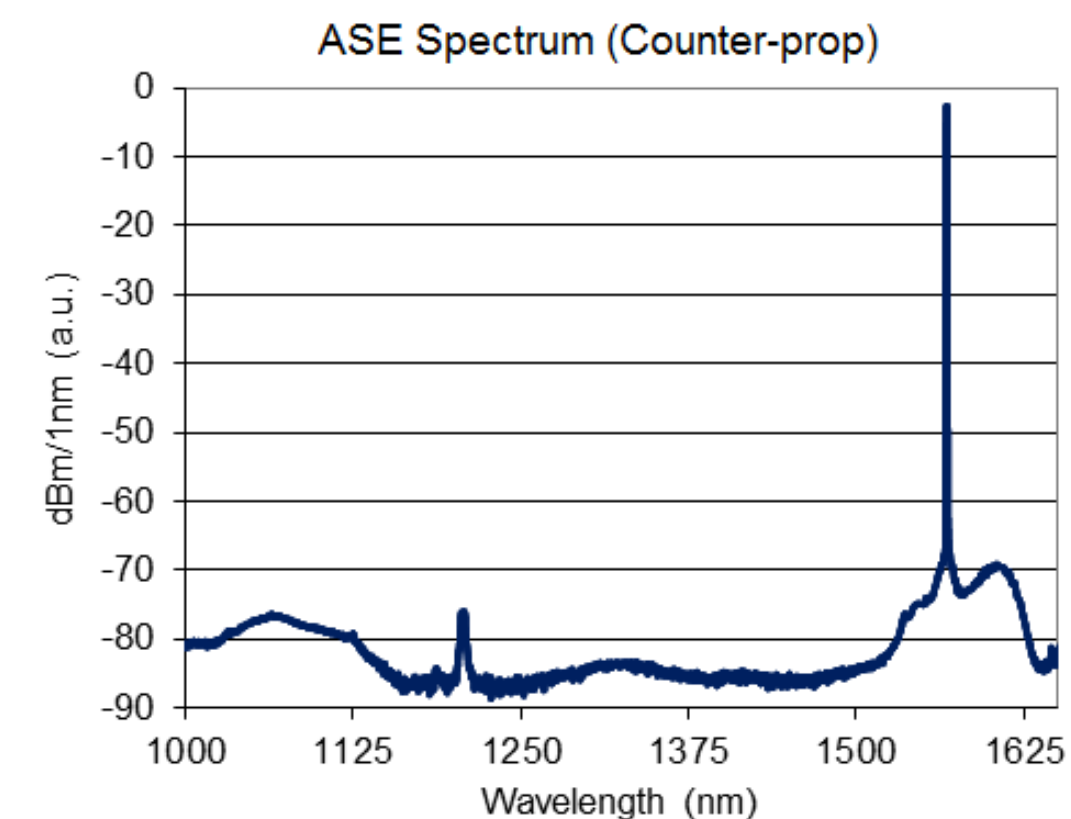
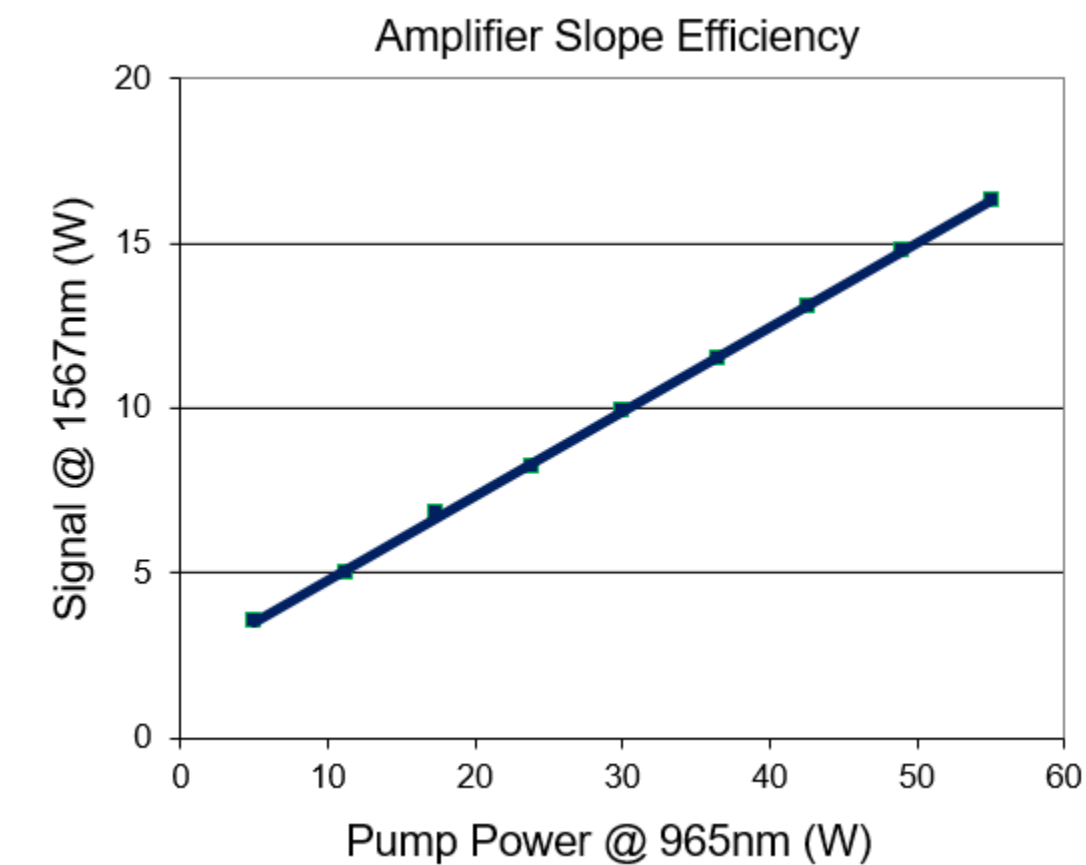
NSP-0102 – DCF-EY-25/250P

1 | ADVANTAGES

- Very High Absorption
- High Conversion Efficiency
- Low NA Design for Good Beam Quality
- Low Amplified Spontaneous Emission

2 | TYPICAL APPLICATIONS

- High Power Amplifier Stage
- >5W/Up to 15kW peak power
- LIDAR
- Ultrashort Pulse Laser/Amplifier





CORACTIVE SOLUTIONS
FOR 2 μ m FIBER LASERS

THULIUM FIBER LASER

EMERGING APPLICATIONS OF CW AND PULSED TM FIBER LASERS

- ❑ Part of the so called «eye-safe» wavelength region, fiber lasers systems operating in this region offer exceptional advantages for free space applications compared to conventional systems that operates at shorter wavelengths.
- ❑ Thulium doped offers the potential to build fiber laser between 1.8 μ m and 2.1 μ m, which is a spectral region including windows of high transparency and strong absorption in the air → favorable for:
 - Applications requiring minimized atmospheric absorption
 - LIDAR application
- ❑ Strong absorption in water also makes this region favorable for medical applications

THULIUM FIBER LASER

EMERGING APPLICATIONS OF CW AND PULSED TM FIBER LASERS

Medical Applications

- Gas Sensing
- Aesthetics/surgery

Plastics/Material Processing

Pharmaceutical Applications

- Molecular spectroscopy

Sensing Technologies

- LIDAR
- Atmospheric Gas Detection

Research

- High power beam propagation
- Nonlinear frequency conversion

FIBERS FOR 2 MICRON LASERS & AMPLIFIERS

TM DOPED FIBERS – PRODUCT LINE

Two-photon cross-relaxation effect leads to very high quantum conversion efficiency, lowering pump power requirements and reducing overall system costs

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad Absorption @793nm (dB/m)	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
SCF-TM-8/125	8.0 ± 1.0	125 ± 1	0.17 ± 0.01	13 ± 2 @1567nm	N/A	SCF-UN-8/125-14
DCF-TM-6/128	6.5 ± 0.5	128 ± 3	0.22 ± 0.02	1.5 ± 0.3	DCF-UN-6/123-23	SCF-UN-6/125-23
DCF-TM-10/128	10.0 ± 1.0	128 ± 3	0.22 ± 0.02	4.0 ± 0.6	DCF-UN-8/125-18	SCF-UN-8/125-18
DCF-TM-12/128P	12.0 ± 1.0	128 ± 3	0.13 ± 0.01	22 ± 3	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-TM-22/400P	22.0 ± 2.0	400 ± 10	0.10 ± 0.01	3.0 ± 0.3	DCF-UN-16/400-10	SCF-UN-16/400-10
NSP-0117 (DCF-TM-25/250P)	25.0 ± 2.5	250 ± 5	0.11 ± 0.01	8.0 ± 1.5	DCF-UN-25/250-10	SCF-UN-25/250-10
NSP-0103 (DCF-TM-9/128P)	9.0 ± 1.0	128 ± 3	0.13 ± 0.01	3.0 ± 0.5	DCF-UN-8/125-14	SCF-UN-8/125-14
NSP-0107 (DCF-TM-6/128-HA)	6.5 ± 0.5	128 ± 3	0.22 ± 0.02	2.5 ± 0.5	DCF-UN-6/123-23	SCF-UN-6/125-23
NSP-0111 (DCF-TM-10/200)	10.0 ± 1.0	200 ± 5	0.23 ± 0.02	3.5 ± 0.5	DCF-UN-8/200-18	SCF-UN-8/200-18

FIBERS FOR 2 MICRON LASERS & AMPLIFIERS

OUR PRODUCT LINE – ADVANTAGES AND TYPICAL CW APPLICATIONS

Model	Advantages	Typical Applications
DCF-TM-6/128	High quantum conversion Efficiency	Up to 20W CW
DCF-TM-10/128	Good beam quality	Up to 20W (CW and Pulsed)
DCF-TM-22/400P	Large core diameter, high pump absorption	≥50W CW
NSP-0103 (DCF-TM-9/128P-13)	High efficiency, good beam quality	> 10W (CW and Pulsed)
NSP-0107 (DCF-TM-6/128-HA)	High absorption, high efficiency	≤ 20W (CW and Pulsed)
NSP-0111 (DCF-TM-10/200)	Very high efficiency	≥50W CW

FIBERS FOR 2 MICRON LASERS & AMPLIFIERS

OUR PRODUCT LINE – ADVANTAGES AND TYPICAL PULSED APPLICATIONS

Model	Advantages	Typical Applications
DCF-TM-10/128	Good beam quality	Up to 20W (CW and Pulsed)
DCF-TM-12/128P	Very high absorption	Single frequency lasers, ultrashort pulse laser 1st Stage Amplifier of pulsed MOPA laser design
NSP-0103 (DCF-TM-9/128P-13)	High efficiency, good beam quality	> 10W (CW and Pulsed) 1st Stage Amplifier for pulsed MOPA laser design
NSP-0107 (DCF-TM-6/128-HA)	High absorption, high efficiency	≤ 20W (CW and Pulsed)
SCF-TM-8/125	Good beam quality	Oscillator or Pre-amplifier Stage for pulsed MOPA laser design

FIBERS FOR 2 MICRON LASERS & AMPLIFIERS

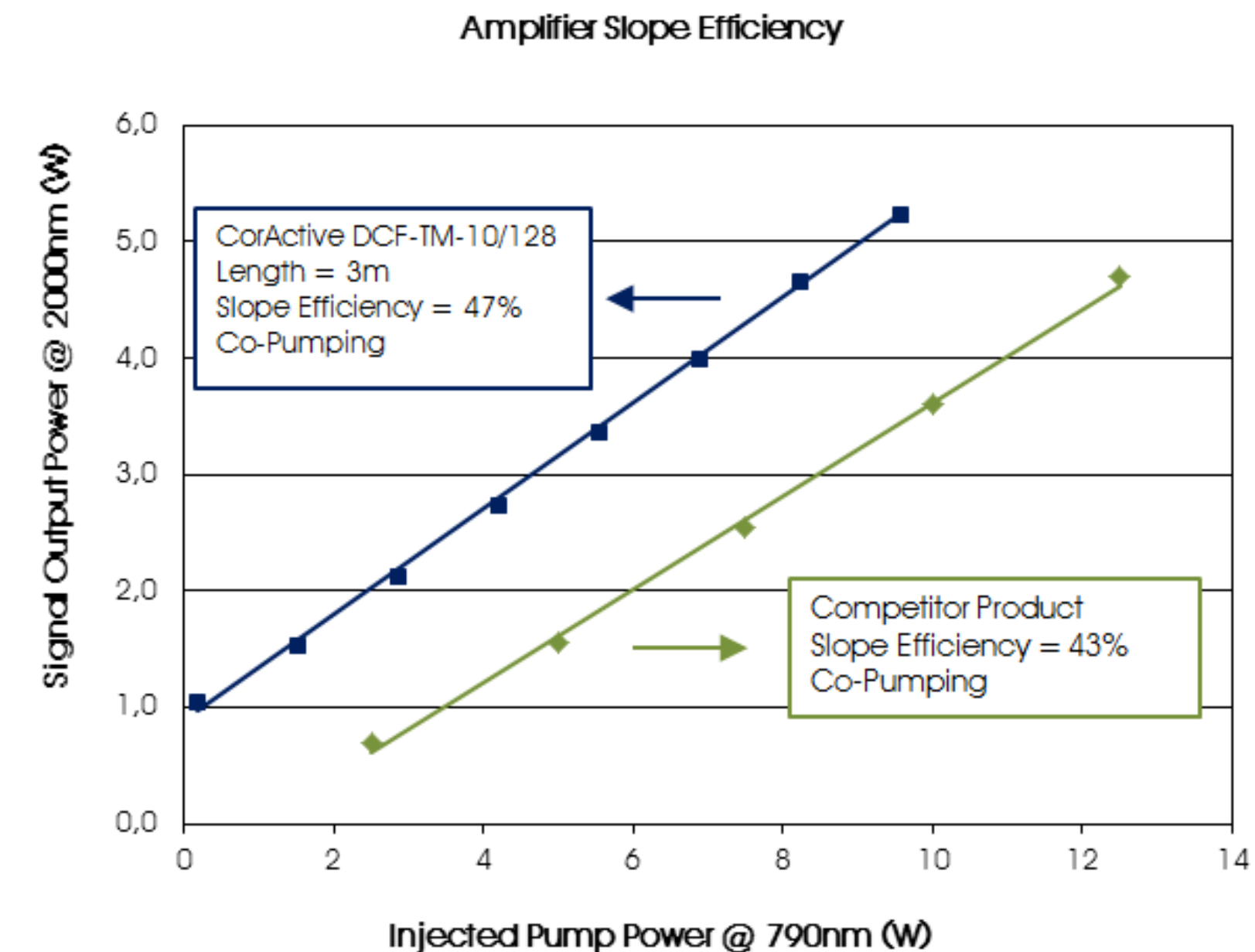
DCF-TM-10/128

1 | ADVANTAGES

- ❑ High Absorption
- ❑ High Conversion Efficiency
- ❑ Good Beam Quality

2 | TYPICAL APPLICATIONS

- ❑ Power Amplifier Stage
- ❑ Up to 10W Average Power
- ❑ LIDAR
- ❑ CW/Pulsed Laser and Amplifiers



FIBERS FOR 2 MICRON LASERS & AMPLIFIERS

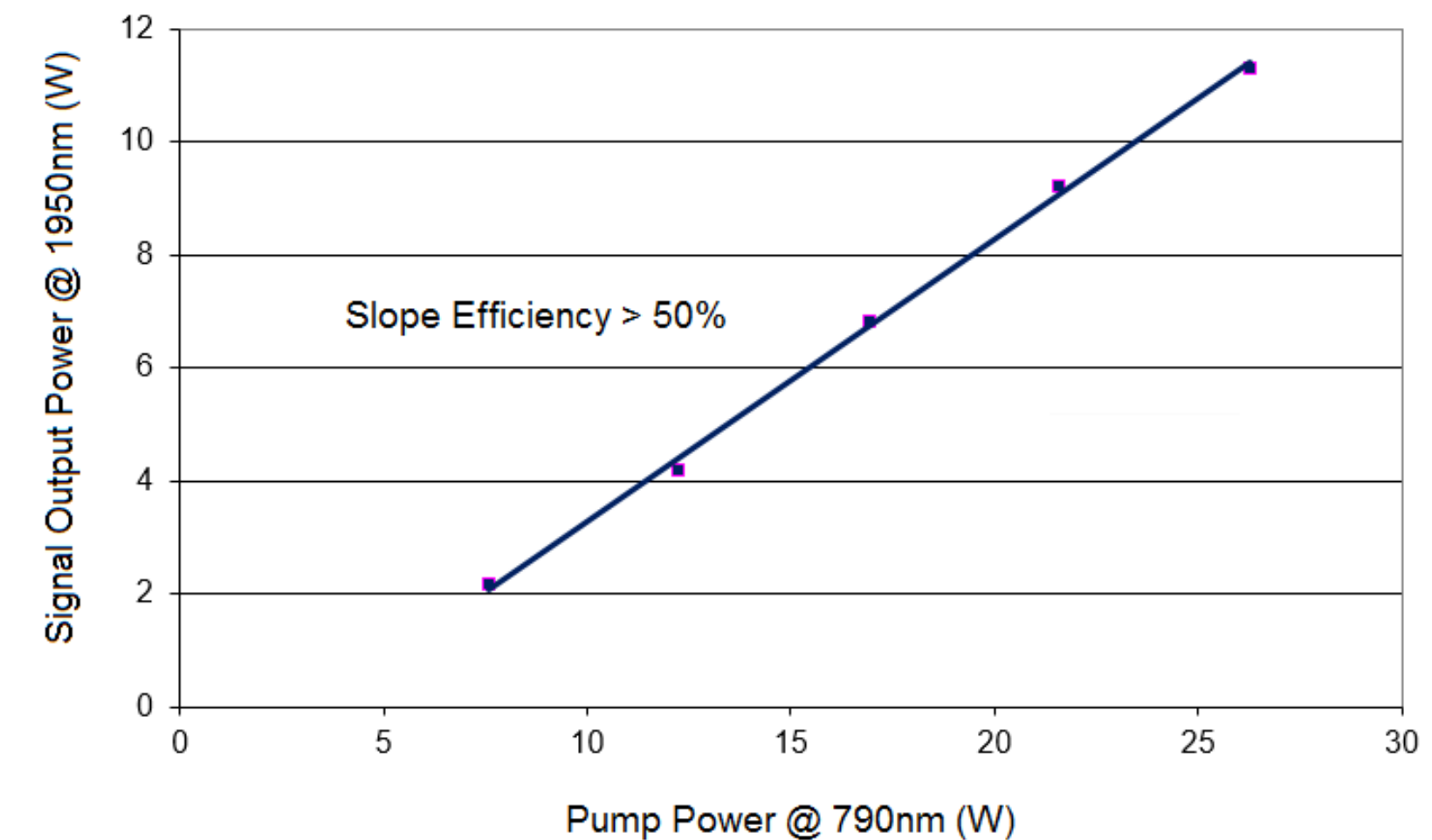
NSP-0111 (DCF-TM-10/200)

1 | ADVANTAGES

- ❑ High Absorption
- ❑ High Conversion Efficiency
- ❑ Good Beam Quality

2 | TYPICAL APPLICATIONS

- ❑ Power Amplifier Stage
- ❑ Optimized for CW Applications
- ❑ >50W Average Output Power





CORACTIVE SOLUTIONS
FOR MID-IR

MID-IR SOLUTION – SELECT CUTOFF SINGLEMODE FIBERS

OVERVIEW

Product Line

CorActive delivers a full range of Infrared Transmission (IRT) optical fibers to address beam delivery requirements in the mid-IR region. CorActive's mid-IR fibers enable significant performance improvements in many applications that have relied on free space optics, low quality fiber or other beam delivery methods.



Two chalcogenide glass compositions are offered:

- IRT-SU: Sulphide glass (As_2S_3) series offer the lowest absorption in the 2-6 μm region.
- IRT-SE: Selenide glass (As_2Se_3) series features the broadest transmission range from 2 μm up to 9 μm .

Advantages

- Designed and optimized for singlemode operation at specific wavelengths*
- Lowest optical losses on the market
- High power handling
- Wide operating range (up to 9 μm)
- Outstanding flexibility and strength
- Proof tested for increased long-term reliability
- Highly reliable and consistent manufacturing process allows production runs in the km range

Typical Applications

- Spectroscopy
- Mid-IR Laser Beam Delivery
- Sensing and Environmental
- Laser Diode Pigtailling

**Multimode transmission fiber also available upon request*

MID-IR SOLUTION – TRANSMISSION FIBERS

PRODUCT LINE



Model	Glass Composition	Core Diameter (μm)	Operating Wavelength (μm)	Cutoff (μm)
IRT-SU-7/170S	As ₂ S ₃	7	2.3 – 4.0	2.0
IRT-SU-9/170S	As ₂ S ₃	9	3.1 – 5.0	2.8
IRT-SE-14/170S	As ₂ Se ₃	14	4.3 – 6.0	4.0
IRT-SE-18/170S	As ₂ Se ₃	18	5.5 – 7.0	5.2

MID-IR SOLUTION – IR MULTIMODE FIBERS

OVERVIEW

Product Line

CorActive delivers a full range of Infrared Transmission (IRT) optical fibers to address beam delivery requirements in the mid-IR region. CorActive's mid-IR fibers enable significant performance improvements in many applications that have relied on free space optics, low quality fiber or other beam delivery methods.

Two chalcogenide glass compositions are offered:

- IRT-SU: Sulphide glass (As_2S_3) series offer the lowest absorption in the 2-6 μm region.
- IRT-SE: Selenide glass (As_2Se_3) series features the broadest transmission range from 2 μm up to 9 μm .

Advantages

- Lowest optical losses on the market
- High power handling
- Wide operating range (up to 9 μm)
- Outstanding flexibility and strength
- Proof tested for increased long-term reliability
- Highly reliable and consistent manufacturing process allows production runs in the km range



Typical Applications

- FT-IR Spectroscopy
- Mid-IR Laser Beam Delivery
- Sensing and Environmental
- Nonlinear Applications

CORACTIVE FIBER SOLUTIONS

MID-IR SOLUTION – IR MULTIMODE FIBERS

PRODUCT LINE

Model	Glass Composition	Core Diameter (μm)	Operating Wavelength (μm)
IRT-SU-70/170	As ₂ S ₃	70	2.0 – 6.0
IRT-SU-100/170	As ₂ S ₃	100	2.0 – 6.0
IRT-SE-100/170	As ₂ Se ₃	100	2.0 – 9.0

FIBER SOLUTIONS FOR 1 MICRON LASERS&LIFIERS

YB DOPED FIBERS – PRODUCT LINE

Model	Core Diameter/ MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @ 915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-YB-6/128S	6.0 \pm 1.0	128 \pm 3	0.12	0.55 \pm 0.10	N/A	DCF-UN-6/125-14	HI 1060
DCF-YB-6/128S-PM	6.0 \pm 1.0	128 \pm 3	0.12 \pm 0.01	0.60 \pm 0.15	$\geq 2.2\text{E-}04$	DCF-UN-6/125-14-PM	PM 980
DCF-YB-7/128-FHA	7.0 \pm 1.0	128 \pm 3	0.19 \pm 0.02	1.3 \pm 0.3	N/A	DCF-UN-6/125-14	HI 1060
DCF-YB-10/128E*	11.0 \pm 0.5	128 \pm 3	0.085 \pm 0.005	1.30 \pm 0.15	N/A	DCF-UN-10/125-08	SCF-UN-10/125-08
DCF-YB-12/125-PM	12.0 \pm 1.0	128 \pm 3	0.085 \pm 0.005	3.0 \pm 0.6	$\geq 2.0\text{E-}04$	DCF-UN-10/125-08	PM 980
DCF-YB-20/128E*	20.0 \pm 1.0	128 \pm 3	0.080 \pm 0.005	3.0 \pm 0.3	N/A	DCF-UN-20/125-080	SCF-UN-20/125-08
DCF-YB-20/128P-FAC	20.0 \pm 2.0	128 \pm 3	0.075 \pm 0.015	5.5 \pm 1.0	N/A	DCF-UN-20/125-100	SCF-UN-20/125-100
YB 100	5 \pm 1	125 \pm 2	0.16 \pm 0.02	10 \pm 2	$\geq 2.0\text{E-}04$	N/A	PM 980
YB 118	4 \pm 1	125 \pm 2	0.22 \pm 0.02	80 \pm 15	N/A	N/A	N/A
YB 198	4 \pm 1	125 \pm 2	0.22 \pm 0.02	275 \pm 50	N/A	N/A	N/A
YB 401	6 \pm 1	125 \pm 1	0.14 \pm 0.02	140 \pm 25	N/A	N/A	HI 1060
YB 401-PM	6 \pm 1	125 \pm 1	0.14 \pm 0.02	140 \pm 25	$\geq 3.0\text{E-}04$	N/A	PM 980
YB 406	5 \pm 1	125 \pm 2	0.16 \pm 0.02	600 \pm 100	N/A	N/A	HI 1060

* Coming soon. Specifications are preliminary

FIBER SOLUTIONS FOR 1.5 MICRON LASERS&LIFIERS

ERBIUM DOPED FIBERS – PRODUCT LINE

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
ER8-6	6.5 ± 0.5	125 ± 0.5	0.22	8 ± 1	N/A	N/A	N/A
ER12-6	6.5 ± 0.5	125 ± 0.5	0.22	12 ± 2	N/A	N/A	N/A
ER35-7-PM	6.5 ± 0.5	125 ± 2	0.22	35 ± 5	≥ 1.4E-04	N/A	N/A
NSP-0106	8.0 ± 1.0	125 ± 0.5	0.12	35 ± 10	N/A	N/A	N/A
NSP-0108	10.0 ± 1.0	125 ± 0.5	0.12	35 ± 10	N/A	N/A	N/A
NSP-0109	12.0 ± 1.0	125 ± 0.5	0.10	35 ± 10	N/A	N/A	N/A
NSP-0110	25.0 ± 2.5	127.5 ± 2.5	0.075	50 ± 10	N/A	N/A	N/A

FIBER SOLUTIONS FOR 1.5 MICRON LASERS&LIFIERS

ERBIUM / YTTERBIUM CO-DOPED FIBERS – PRODUCT LINE

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-EY-6/128	6.5 ± 0.8	128 ± 3	0.20	0.90 ± 0.15	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-6/128-PM	6.5 ± 0.8	128 ± 3	0.20	0.70 ± 0.15	≥ 1.2E-04	DCF-UN-8/125-14-PM	PM 1550
DCF-EY-6/105/125	6.5 ± 0.8	105	0.20	1.2 ± 0.2	N/A	DCF-UN-8/105/125-14	SCF-UN-8/125-14
DCF-EY-8/105/125	8.0 ± 1.0	105	0.22 ± 0.02	2.75 ± 0.5	N/A	DCF-UN-8/105/125-14	SCF-UN-8/125-14
DCF-EY-10/128	10.0 ± 1.0	128 ± 3	0.20 ± 0.02	2.0 ± 0.5	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-10/128-PM	10.0 ± 2.0	128 ± 3	0.20 ± 0.02	2.0 ± 0.5	≥ 1.4E-04	DCF-UN-8/125-14-PM	PM 1550
DCF-EY-12/130	12.0 ± 1.0	130 ± 3	0.20 ± 0.02	2.8 ± 0.9	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-EY-10/200	10.0 ± 1.5	200 ± 10	0.20 ± 0.02	1.50 ± 0.25	N/A	DCF-UN-8/200-14	SCF-UN-8/200-14
DCF-EY-16/250P	16.0 ± 1.0	250 ± 5	0.11 ± 0.01	1.75 ± 0.25	N/A	DCF-UN-15/250-10	SCF-UN-15/250-10
NSP-0100	8.0 ± 1.0	128 ± 2	0.12 ± 0.01	1.50 ± 0.5	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
NSP-0101	11.0 ± 1.0	128 ± 3	0.16 ± 0.01	2.5 ± 1.0	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
NSP-0102	25.0 ± 2.5	250 ± 5	0.10 ± 0.01	5.0 ± 1.0	N/A	DCF-UN-25/250-10	SCF-UN-25/250-10
EY 305	7.0 ± 1.0	125 ± 1	0.18	170 ± 20	N/A	N/A	N/A

FIBER SOLUTIONS FOR 2 MICRON LASERS&LIFIERS

TM DOPED FIBERS – PRODUCT LINE

Model	Core Diameter /MFD (μm)	Clad Diameter (μm)	Core NA	Clad/Core Absorption @915nm (dB/m)	Birefringence	Matched Passive Double Clad Fiber	Matched Passive Single Clad Fiber
DCF-TM-6/128	6.5 ± 0.5	128 ± 3	0.22 ± 0.02	1.5 ± 0.3	N/A	DCF-UN-6/123-23	SCF-UN-6/125-23
DCF-TM-10/128	10.0 ± 1.0	128 ± 3	0.22 ± 0.02	4.0 ± 0.6	N/A	DCF-UN-8/125-18	SCF-UN-8/125-18
DCF-TM-12/128P	12.0 ± 1.0	128 ± 3	0.13 ± 0.01	22 ± 3	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
DCF-TM-22/400P	22.0 ± 2.0	400 ± 10	0.10 ± 0.01	3.0 ± 0.3	N/A	DCF-UN-16/400-10	SCF-UN-16/400-10
NSP-0103	9.0 ± 1.0	128 ± 3	0.13 ± 0.01	3.0 ± 0.5	N/A	DCF-UN-8/125-14	SCF-UN-8/125-14
TH-512	9.0 ± 1.0	125 ± 1	0.16 ± 0.02	> 120	N/A	N/A	N/A
NSP-107	6.5 ± 0.5	128 ± 3	0.22 ± 0.02	2.5 ± 0.5	N/A	DCF-UN-6/123-23	SCF-UN-6/125-23
NSP-0111	10.0 ± 1.0	200 ± 5	0.23 ± 0.02	3.5 ± 0.5	N/A	DCF-UN-8/200-18	SCF-UN-8/200-18
SCF-TM-8/125	8.0 ± 1.0	125 ± 1	0.17 ± 0.01	13 ± 2 @1567nm	N/A	N/A	SCF-UN-8/125-14

For more information about our product,
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