

# aeroGAIN-ROD

High-power PM ytterbium rod fiber gain module



## HIGH-POWER FIBER AMPLIFICATION SYSTEM FOR ULTRAFAST LASERS

Ideal for manufacturing of ultrafast high-power pulsed lasers

The aeroGAIN-ROD is the ultimate fiber amplifier module for pulsed lasers. It exhibits an exceptional power handling previously only available in solid-state configurations.

With a  $3300 \mu\text{m}^2$  mode field area and high pump absorption, the aeroGAIN-ROD module offers high performance for demanding peak power applications.

### Applications

- Ultrafast high-power pulsed lasers

# aeroGAIN-ROD

## Ideal gain medium for ultrafast high-power amplifiers

The excellent mode quality and easy coupling make the aeroGAIN-ROD module an ideal gain medium for ultrafast high-power amplifiers.

## Large numerical aperture and reduced reflections

The pump light is guided by our proven airclad technology which boasts high reliability, high damage threshold, and a large NA.

The modules come with high-power AR coated endcaps. The output endcap is slightly angled to prevent reflections.

## Robust design optimized for OEM integration

The rugged aluminum body makes the module easy to handle and mount for both OEM integration and scientific laboratory set-ups.

## Thermal management ensures high performance

Integrated water cooling with quick coupling ensures efficient thermal management and a long, maintenance-free lifetime of thousands of hours.

## Diffraction-limited gain modules

Both aeroGAIN-ROD models are diffraction-limited gain modules which gives several advantages compared to standard multimode Large Mode Area fibers:

- Better output beam stability
- Excellent beam quality
- No coiling-induced mode area compression

## Features

- Diffraction-limited beam quality
- High peak power damage threshold
- High NA pump cladding
- AR coated endcaps
- Optimized for 1030 - 1040 nm
- Compact and robust industrial format
- Long lifetime

# SPECIFICATIONS

## Optical

Model	1.1	2.1
Signal core diameter [ $\mu\text{m}$ ]	$\approx 55$	$\approx 85$
Signal wavelength [nm]	1030 - 1040	1030 - 1040
Pump cladding NA (FWHM @ 950 nm)	$\geq 0.5$	$\geq 0.5$
Gain fiber length [mm]	$804 \pm 3$	$804 \pm 3$
Cladding absorption [dB]		
@ 915 nm	$4.7 \pm 0.7$	$5 \pm 0.7$
@ 976 nm, nominal	$\approx 14$	$\approx 15$
PER, typical [dB]	$\geq 15$	$\geq 15$
Typical optical efficiency [%] <sup>1)</sup>	$\geq 60$	$\geq 60$
Beam quality	$M^2 \leq 1.3$	$M^2 \leq 1.3$
Mode-field diameter, $1/e^2$ [ $\mu\text{m}$ ]	$45 \pm 4$	$65 \pm 5$
Signal average power [W]	$\leq 100$	$\leq 100$
Pump cladding diameter [ $\mu\text{m}$ ]	$200 \pm 10$	$260 \pm 15$

1) Seed level 5 W at 1030 nm, 80 cm rod length, 976 nm pumping.

## Mechanical

Dimensions (WxHxL) [ $\text{mm}^3$ ]	35 x 35.2 x 817
Weight [kg]	2.5
Endcap length [mm]	5
Endcap diameter [mm]	6
Endcap coating R @ 1030 nm [%]	$\leq 0.2$
Endcap coating R @ 976 nm [%]	$\leq 0.3$
Endcap angle, input [°]	$\leq 0.5$
Endcap angle, output [°]	$2 \pm 0.7$
Optical height [mm]	25

# SPECIFICATIONS

## Water cooling

Water cooling connection [mm / "]	8 mm x 1/4" BSPP
Recommended water flow <sup>2)</sup> [liter/minute]	> 1
Recommended water temperature <sup>2)</sup> [°C]	≈ 25
Operating temperature [°C]	20 — 30 (ambient)
Storage temperature [°C]	-20 — 60

2) We recommend DI water containing an anti-corrosive additive to protect the aluminum cooling circuit. Required water flow and water temperature depend on the actual optical system parameters.

All NKT Photonics fiber products are produced under our quality management system certified in accordance with the ISO 9001:2015 standard.

