

SUCCESS STORY

Innovative All-fiber Components Improve High Power Fiber Laser Systems for DoD

ALL-FIBER OPTICAL ISOLATORS FOR HIGH ENERGY LASERS

TOPIC NUMBER: AF171-108

CONTRACT NUMBER: FA8650-18-C-5077

SBIR COMPANY NAME: ADVALUE PHOTONICS INC

TECHNICAL PROJECT OFFICE: AFRL/RXAP, WPAFB, OH

SPONSORING ORGANIZATION: AFRL, WPAFB

PUBLISHED: AUGUST 2021

THE BASICS

- Components offer better resilience against vibration, humidity, and temperature in internal systems
- Lose less light between fixed points in the fiber
- Expects to grow by 10% annually based on the profits from this project



Photo by Keith Lewis.

WITH THE SUPPORT OF SBIR/STTR, ARIZONA-BASED ADVALUE PHOTONICS HAS DEVELOPED ALL-FIBER BASED COMPONENTS FOR HIGH POWER LASER SYSTEMS THAT OFFER BETTER RELIABILITY AND EFFICIENCY THAN THE INCUMBENT FREE-SPACE FIBER PIGTAILED COMPONENTS.

These components offer better resilience against vibration, humidity, and temperature in internal systems. Additionally, these improved components lose less light between fixed points in the fiber.

The development of these components has allowed AdValue Photonics to develop commercial products which produce revenue for the company and to improve their other fiber laser products. The company expects to grow by 10% annually based on the profits from this project.

The success of this project has also opened other research doors for AdValue Photonics, and they continue to work to optimize their laser products at other wavelengths, which may significantly improve their performance.

BEHIND THE TECHNOLOGY

Previous “free space” fiber optics in light emitting components and other laser technology was unreliable and had a high probability of efficiency loss due to misalignment. These problems came from variations in temperature and humidity, as well as environmental vibrations.

AdValue Photonics eliminated all free space components by replacing them with an all-fiber design that eliminated alignment errors in laser-system assembly, thereby removing the variables that created so many problems.

Optical isolators are a critical component in laser system design. They transmit light in laser technology. The all-fiber design perfected by AdValue Photonics improves reliability and reduces costs over the life of the system.

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AdValue Photonics has secured a contract supporting the Department of Defense to develop and implement this technology for their laser systems.

SBIR FUNDING AND AFRL'S EXPERTISE WERE CRITICAL

The Air Force SBIR funding and AFRL guidance was instrumental in the advancement of the laser component technology.

After an Air Force SBIR investment of about \$897,000, AdValue Photonics has gained contracts from the Department of Defense worth \$1,148,000. This does not take into consideration the money that the technology will save, which is impossible to estimate. 

The all-fiber design perfected by AdValue Photonics improves reliability and reduces costs over the life of the system.