

Introduction

At SPI Lasers we are continually developing innovative Fiber Laser based solutions for the industrial material processing market. One such recent innovation is the ability to tailor the beam characteristics (including spot size and beam profile) delivered to the laser workpiece, for the specific application in use, whether it be cutting, welding, piercing or additive manufacture.

For some applications having a dynamic, controllable beam profile, brings significant advantages, as the beam can be adjusted for the specific process step within the overall manufacturing cycle. Our latest variMODE product feature incorporates several novel approaches for this technology, with its proprietary IP covered by patents and applications.

Full Feature List

- A novel new approach to variable beam quality Fiber Lasers that modifies the spatial modes in the core of the delivery fiber:
 - Select in real time the beam profile that's best for your process.
 - Offers both faster process speeds and better cut quality.
- Based on the internal 'All-in-Fiber core' technology, it negates the need for extra optical components that can increase the complexity and damage risk of other approaches:
 - Provides the full laser power in all beam profile modes.
 - Optimises the utilisation of laser power purchased.
- Maximum BPP for variMODE has been set to match NA of standard commercially available laser processing heads.
- Uses standard beam delivery fibers:
 - No need to buy special multi-cladding fibers.
- Simple user interface for optimal control and integration using FiberView GUI or digital PLC control.

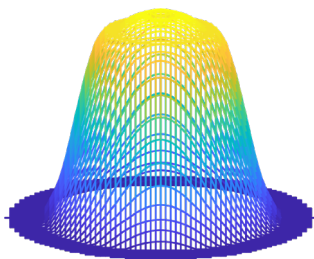
Benefits

- Beam profile tailored to your process
- Vastly increases process window
 - Dramatically reduces set up times
- Optimised processing of wider range of materials and thicknesses
 - Improved system flexibility
- Potential to use standard focus head, replacing a zoom version
 - Reduced weight and cost of overall system

Key Features

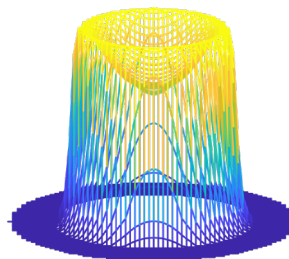
- Dynamic switchable laser beam profile
 - From 100µm delivery fibers
- Uniquely maintains all beam power in core of delivery fiber
 - All the laser power available for each profile
- Available for 3kW to 10kW redPOWER QUBE Fiber Lasers

Low BPP Mode



Optimised for high speed, high quality piercing in thick sheets and giving fastest cut speeds in thin materials.

High BPP Mode



Optimised for cutting through thick metal sheets at high speed, producing an excellent surface finish on mild steel.

Switch between beams at your convenience



40ms

Specifications

At output of 100µm BDO Fiber

Parameter	Low BPP Setting	High BPP Setting	Notes
Beam Parameter Product ¹	3.3±0.3mm.mrad	5.5±0.3mm.mrad	
Beam Divergence (86% enclosed energy)	130mrad	220mrad	Full Angle
Beam Divergence (99.5% enclosed energy)	180mrad	320mrad	Full Angle
Switching Time	<40ms		Between BPP settings

Notes

1. Beam Parameter Product = beam radius x half angle divergence

Ordering Information

variMODE is available as an optional extra on redPOWER QUBE Cabinet Lasers with powers from 3kW to 10kW. All variMODE lasers use a 100um core diameter delivery fiber, with lengths from 5m to 20m. The variMODE option needs to be specified at time of ordering and is indicated in the Product Codes with a 'V' in the last number block

eg.: SP-xxxx-F-W-100-yy-PIQ-B1z-101-V00.

Where 'xxxx' represents the laser power, 'yy' is the delivery fiber length (in meters) and 'z' determines the appropriate mains electrical supply requirements. See the redPOWER QUBE Cabinet datasheet (SM-S00494) for more information on these lasers.