ofs
A Furukawa Company

Optical Fiber and Cable Solutions
for Fiber Laser Modules

FIBER LASER BUILDING BLOCKS
for your Next Multi-Kilowatt Fiber Laser

Cutting

Micro

Welding

Marking

www.ofsoptics.com

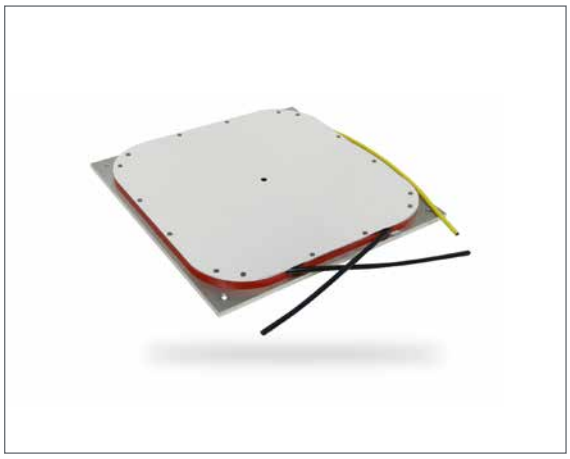
OFS: Your Partner on the Way to Multi-kW

OFS' family of building-block products are designed for the construction of fiber-based, high power systems, all from the ground up. These rugged OEM modules incorporate advanced fiber solutions to enable seamless scaling to multi-kW power levels. As requirements change, one can plan with confidence that the parts selected today will match alongside those of tomorrow.

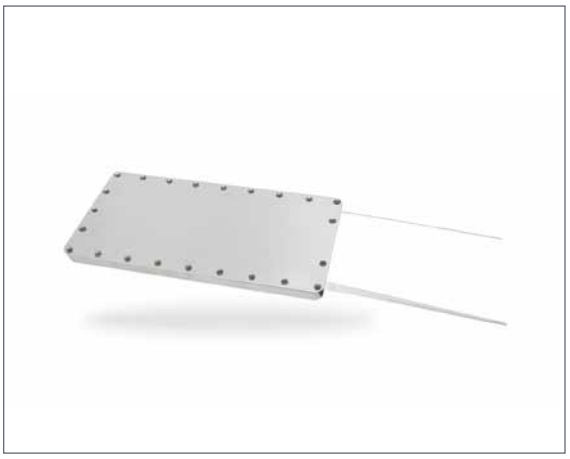
Two Product Lines, One Solution

OFS TrueMode Fiber Laser Cavities package Ytterbium fiber resonators with matching pump combiner configurations to deliver up to 1.5 kW of true single-mode output when using suitably chosen pump diodes. To advance to multi-kW power levels, OFS TrueM2 Beam Combiner modules offer a compatible means of merging multiple laser outputs into multimode delivery fibers.

TrueMode Fiber Laser Cavity

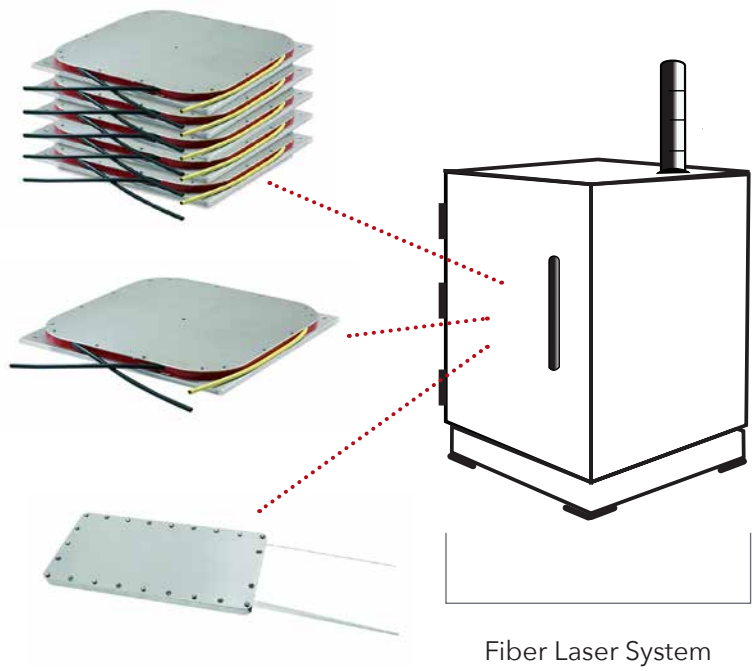


TrueM2 Beam Combiner



Versatility

The laser system market today is increasingly competitive, and original equipment manufacturers must find every opportunity to customize their products. However, overly complex modules leave little choice to system designers. OFS' approach, instead, maximizes the ability to differentiate. By supplying basic glass engines only, OFS offers customers the freedom of electronics, software, thermal, and mechanical decisions. Designers can start with simple "light in/light out" optical functions provided in worry-free building blocks, and build their own value around a solid optical foundation.



Fiber Laser System

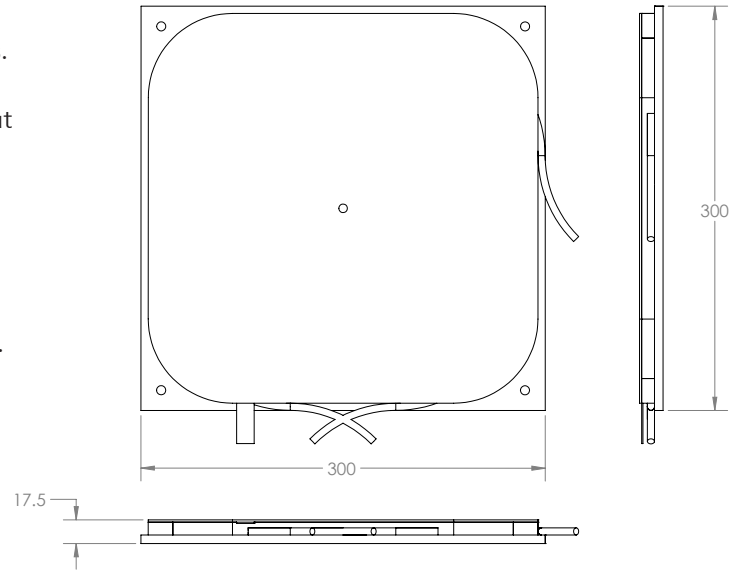
Build Your kW System

Select a Cavity Option

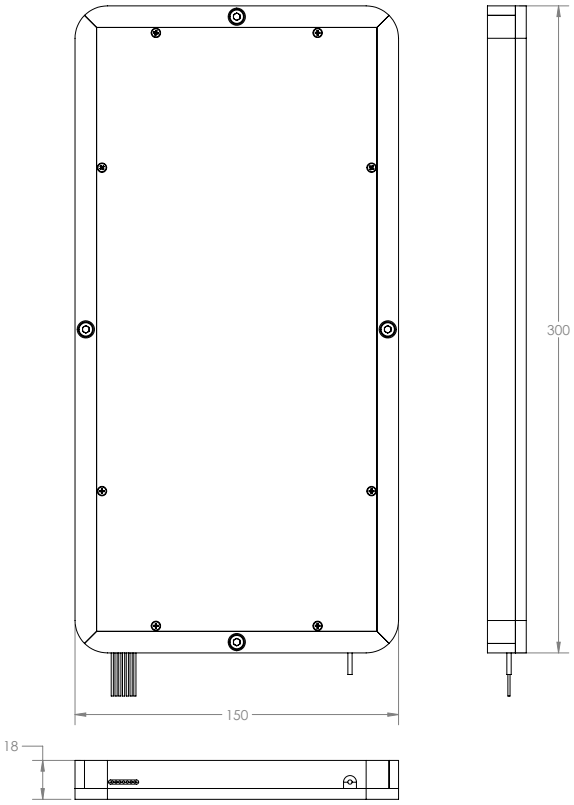
The TrueMode-kW is designed for kW and, when used with our TrueM2 beam combiners, multi-kW applications. The TrueMode-kW cavity is designed to reduce SRS and other nonlinear effects that can limit the amount of output power available in the kW regime. This platform is also optimized to maximize thermal dissipation.

The breakthrough design of the TrueMode-kW cavity uses large numerical aperture pump diodes and incorporates a large pump diode count, suitable for use with diodes delivering greater than 50W of pump power.

TrueMode-kW cavities are designed for use with a TrueM2 Beam Combiner, a compatible output fiber is provided.



	TrueMode-kW	TrueMode-kW
Configuration	Fwd. Pumped	Bi-directional Pumped
Max Output Power	1kW	1, 1.3, 1.5kW
Compatibility	TrueM2-14	
Center wavelength (nm)	1070 ± 5 nm	
Optical Efficiency (%) (with 915 nm pump)	>68%	
Pump Diode Requirements		
Maximum Number of Input Ports	18	36
Diode Fiber Pigtail	105-111/125, 135/155	105-110/125
Fiber Numerical Aperture	0.22	
Beam Delivery		
Output Fiber	14/200	
Beam Quality M2	<1.1 Single-mode Output	
Features		
Visible Pilot	Yes	
Transport and Storage (temp)	-20 to 60 °C (Non-condensing under operation and storage)	
Approximate Dimensions (mm)	300 x 300 x 17 mm	
Item #	**7001000-08**	**7001000-XX**



Select a Combining Option

For multi-kW power levels, beam combining has become the method of choice to reach higher powers as needed. This modular approach offers many benefits in terms of building, spare provisioning, and future upgrades. OFS' TrueM2 beam combiners provide a practical means of scaling with only a few simple splices. OFS' TrueM2 beam combiners offer two ways to reach multi-kW power levels:

You can build with matching TrueMode cavities from OFS, or combine your existing fiber lasers with matching output.

All TrueMode Laser Cavity building blocks can be equipped with a singlemode output fiber, ready for direct coupling to a matching TrueM2 beam combiner. This truly single-mode operation helps ensure a low loss connection which reduces instabilities and feedback effects.

Together, the TrueMode and TrueM2 platforms provide a complete multi-kW solution.

	True M2-14 6x1
Optical Power Rating (Total)	≤6 kW
Transmission Performance	>95%
Number of Inputs	6
Visible Pilot Input	1 (14/200)
Nominal Input Fiber MFD (µm)	14
Cladding Diameter (µm)	200
Max. Input Power (per port)	1100W
Output Fiber Type (µm)	50/360
NA	0.22
Beam Profile	Flat-top
Beam Parameter Product	3-4 mm-mrad
Integrated Thermal Monitors	10-pin Connector
Transport and Storage (Temp/RH)	-20 to 60 °C (Non-condensing under operation and storage)
Approximate Dimensions (mm)	300 x 150 x 15
Item #	7000801

OFS Technical Heritage around Every Bend

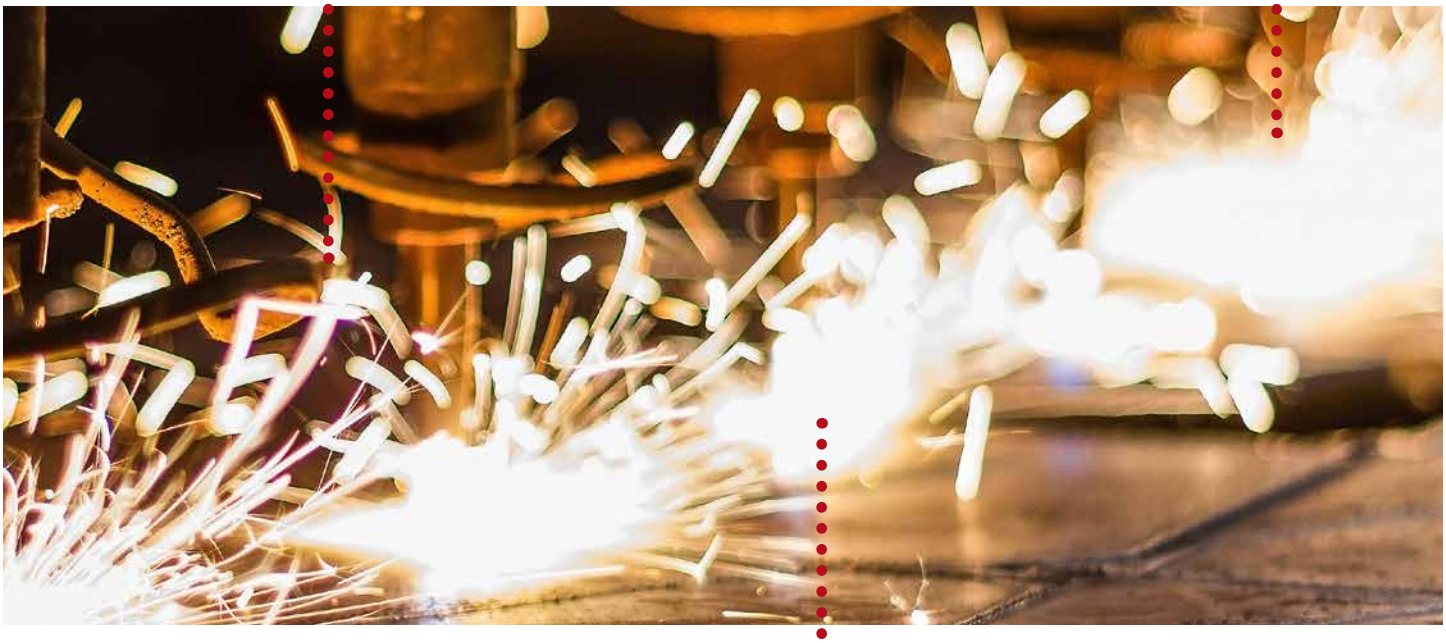
OFS TrueMode™ Fiber Laser Cavities package Ytterbium fiber resonators with matching pump combiner configurations to deliver up to 1.5 kW of true single-mode output when using suitably chosen pump diodes. To advance to multi-kW power levels, OFS TrueM2™ Beam Combiner modules offer a compatible means of merging multiple laser outputs into multimode delivery fibers.

All glass, no free space

Combining multiple fiber lasers into a single fiber entrusts system reliability to a solitary component, the laser combiner. Based on patented technology, OFS leverages precision core manufacturing to make a fused, all-glass structure for high reliabil-ity. No open endfaces or lens elements to misalign or become contaminated.

More than a match, true compatibility

OFS has always designed and manufactured fibers around targeted mode sizes, not core diameters. But why stop there? Performance AFTER splicing is what really matters, and modern dopants and profiles can be quite challenging. With the help from truly compatible fibers, the newest cavity designs from OFS achieve unparalleled performance, yielding 975 nm efficiency with the simplicity of 915 nm pumping.



Smart choices

Specialty fiber suppliers offer a myriad of core designs with over-lapping application categories, making intelligent design a confusing world with too many choices. OFS supports the growing trend toward industry adoption of standard sizes. This underlying strategy enables TrueMode cavities and TrueM2 combiner building-blocks to safeguard compatibility well into the future.

Consistency today, and tomorrow

OFS rare-earth fibers are renowned for their high level of uniformity and consistency. A high level of testing and screening goes into every product. Gain fibers used in TrueMode cavities operate with less cross sectional area of the cladding than conventional fiber, to enable shortened cavity lengths which minimize optical non-linearities.

Packaging for long term operation

OFS invented the manufacturing concept of layered fiber coils to improve thermal efficiency of gain fibers. These ideas continue today to maintain all components in proper working condition for long lifetimes.

Gratings optimized for high power

A cavity is expected to operate over a broad thermal range and laser mirrors should be engineered with sufficient margin. OFS pioneered and patented techniques of hydrogen loading to produce highly photosensitive fibers capable of providing maximum bandwidth.

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For additional information please contact your sales representative.
You can also visit our website at **www.ofsoptics.com**
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