



OZ Optics

shop.ozoptics.com
www.ozoptics.com

219 Westbrook Road
Ottawa, ON, Canada, K0A 1L0

Toll free: 1-800-361-5415
Telephone: 1-613-831-0981
Fax: 1-613-836-5089
sales@ozoptics.com

CHROMAMIX MULTI-WAVELENGTH FIBER COMBINERS FOR LASER ENGINES AND DELIVERY SYSTEMS

PRELIMINARY

Features

- Custom Multi wavelength combinations (UV to near IR)
- Single Mode (SM), Polarization-Maintaining (PM), Photonic Crystal Fiber (PCF) and Specialty fibers
- Low insertion loss and high coupling efficiency
- High polarization extinction ratio (PER)
- High power handling
- Available with integrated laser diodes for potential OEM applications
- Replace free-space beam combining systems with stable fiber-based integration
- Compact design
- Alignment-free, compliant with low-outgassing / space / ultra-clean applications
- Optional built-in manual attenuator

Applications

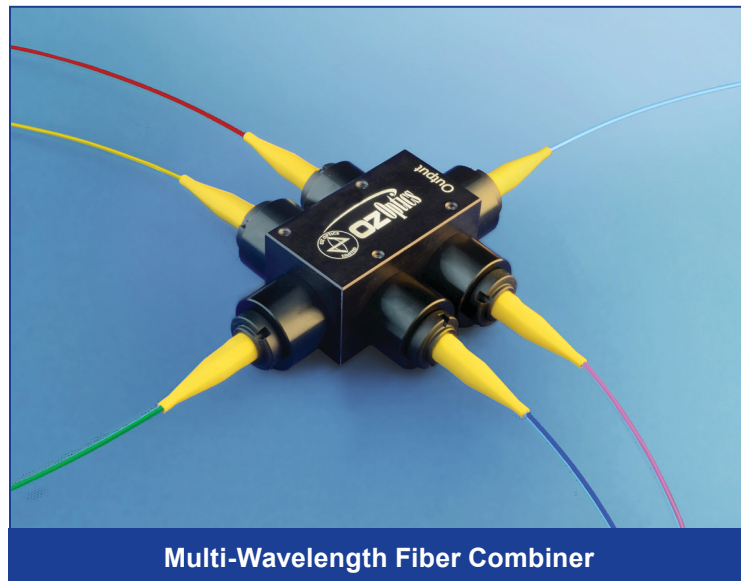
- Fluorescence microscopy and confocal imaging
- Flow cytometry and bio-analytical instrumentation
- Raman and multi-line spectroscopy
- Quantum optics and photonics research
- Semiconductor inspection and UV metrology

Product Description

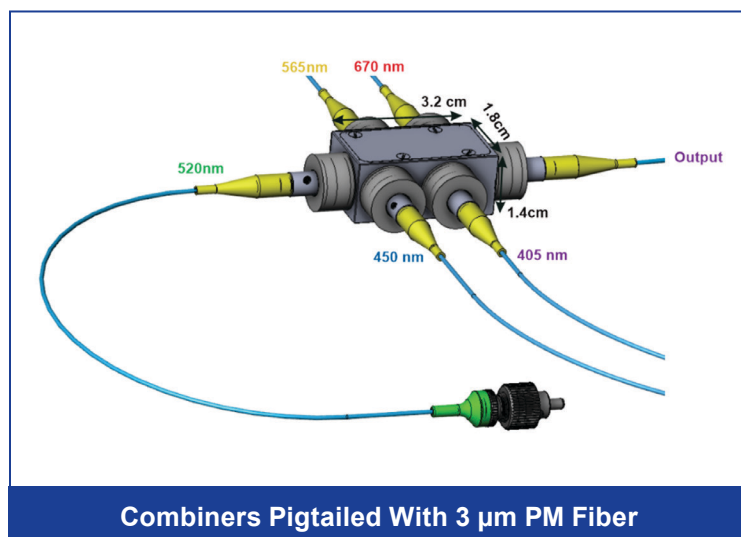
OZ Optics provides **custom-engineered fiber combiner solutions** designed for integrating multiple ultraviolet, visible, and infrared laser sources into one multimode, singlemode, polarization-maintaining or photonic crystal output fiber while maintaining polarization and minimizing loss.

The device is a designed-to-spec solution for OEM customers requiring **precision stability and integration flexibility** beyond standard catalog components.

The Chromamix combiner complements our **OptoGlide Precision Laser Delivery System** by addressing applications where free-space wavelength multiplexing provides superior performance over conventional fused-fiber WDM technology.



Multi-Wavelength Fiber Combiner



Combiners Pigtailed With 3 μ m PM Fiber

Standard Specification: Fiber to Fiber Combiner

Channel	Violet	Violet -Blue	Green	Yellow-Red	Red-IR
	For five wavelength version			For five wavelength version	
Available wavelengths (nm) ¹	390–410	430–488	505–535	565–600	630–800
Fiber type	3/125 µm for SM or PM fiber				
Return loss	40 dB, Optional AR coated up to 60 dB				
Insertion loss ²	Typical < 1.5 dB for 5 color combiner, 2 dB Maximum				
ER (PM Version)	Typical > 18 dB for 5 color combiner, > 15 dB Minimum				
Operating temperature	20 to +60°C				
Dimensions	3 color combiner: 45 x 22 x 22 mm for standard size, 18 x 17 x 14 mm for compact size 4 and 5 color combiner: 67 x 45 x 22 mm for standard size, 18 x 32 x 14 mm for compact size				

¹ These are standard center wavelengths. Contact OZ Optics if a specific wavelength is required.
Please note that specific wavelength will depend on availability on suitable sources.

² Excluding connector insertion loss, and for 3/125 SM and PM fiber.

Description RGB combiner fiber to fiber

Wavelength Division Multiplexer:

Part number

WDM-1NA-111-W₁W₂W₃W₄W₅-a/b-ABCD-LB-XYZ-JD-L

N = Number of wavelengths to combine (2,3, 4, 5, etc.)

A = Package style
P = Standard size
C = Compact size

W₁W₂...W₅ = Wavelengths to be combined, in nanometers (shortest to longest) up to a maximum of five wavelengths. (Example 405,450,520,565,670)

a/b = Fiber core/cladding size, in microns. 3/125 nm standard for visible singlemode or PM fiber. For multimode fiber or other wavelength ranges refer to our *Standard Tables*.
https://www.ozoptics.com/ALLNEW_PDF/DTS0079.pdf

ABCD. Fiber types on each port
M = Multimode
S = Singlemode
P = Polarization Maintaining
Specialty SM and PM fibers
Photonic Crystal Fibers (PCF),
Hollow core fiber, on LMA
fibers available upon request

L = Fiber length, in meter

JD = Fiber jacket type:
1 = 900 µm OD Hytel jacket
3 = 3 mm OD Kevlar reinforced
PVC cable

For other cables refer to our *Standard Tables*.
https://www.ozoptics.com/ALLNEW_PDF/DTS0079.pdf

XYZ = Connector type on each end
3S = Super NTT-FC/PC
3U = Ultra NTT-FC/PC
3A = Angled NTT-FC/PC
SC = SC
SCA = Angled SC
LC = LC
LCA = Angled LC
X = No Connector

For other connectors refer to our *Standard Tables*.
https://www.ozoptics.com/ALLNEW_PDF/DTS0079.pdf

LB = Backreflection level: 40 dB for singlemode or PM fibers only.
35 dB for multimode fibers.

Ordering Information For Custom Parts

OZ Optics welcomes the opportunity to provide custom designed products to meet your application needs. As with most manufacturers, customized products do take additional effort so please expect some differences in the pricing compared to our standard parts. In particular, we will need additional time to prepare a comprehensive quotation, and lead times will be longer than normal. In some cases non-recurring engineering (NRE) charges will be necessary. These points will be carefully explained in your quotation, so your decision will be as well informed as possible. We strongly recommend buying our standard products.

Questionnaire For Custom Parts

1. What wavelengths are you interested in?
2. What power levels are required?
3. What type of fiber is needed? Singlemode, Multimode or PM?
4. How long should the fiber be?
5. What type of fiber jacket/cabling do you need?
6. What connector type are you using?
7. Do you need a collimated or focused output beam?
8. If a collimated beam is required, what is the desired beam diameter?
9. If a focused spot is required, what is the desired spot size and working distance?

End Use Applications

Typical applications for our multi wavelength delivery system include the following.

Industry	Application
Flow Cytometry	High-parameter cell sorting and spectral analysis.
Confocal Microscopy	STED and STORM super-resolution microscopes.
DNA Sequencing	High-throughput genomic mapping.
Semiconductor	Wafer inspection and metrology.

Customer Requirements – Fiber Combiner

Frequently Asked Questions (FAQs)

Q: What wavelength ranges are available?

A: OZ Optics offers a variety of sources and combiners working from 375 nm to > 1100 nm.

Q: Can the system handle higher powers?

A: Yes, OZ Optics' design can handle up to 200 mW. For higher power applications a custom design can be done to handle up to 2 W, using large core multimode fiber.

Q: Do you offer systems that can combine more than three wavelengths?

A: Yes, systems that combine up to five different wavelengths can also be made.

Q: Can OZ Optics manufacture sources using a customer supplied laser diode and/or fiber?

A: Yes, please provide OZ Optics with detailed information.

Q: Does OZ Optics offer higher power sources than what is standard on the data sheet?

A: Yes, please provide OZ Optics with the requested fiber output power and fiber type and we'll work with you to find a solution.

Q: Why do you recommend integrated systems rather than individual sources and combiners for visible wavelengths?

A: For visible wavelengths the fiber core size is 4 microns or smaller. For such small sizes, mechanical tolerances along with beam divergence may result in high losses at the receptacle interface. Using an integrated system avoids this issue.

Q: Can I control the output power of each wavelength source?

A: Yes, as an option output power for each source can be adjusted via individual attenuator screws, allowing the customer to balance power levels as needed.

Q: Can a combiner source be made to deliver a collimated or focused beam?

A: Yes, we can add a collimator or a focuser to the output end of the pigtailed fiber delivery system.

Q: Can we offer a combiner with built-in optical shutter or blocking attenuator?

A: Yes, we can customized to include optical shutter, or optical variable attenuator or any other specials features. Contact OZ Optics to provide your product requirements.

Request for General Information:

Company:

Contact Name / Role:

Application: (e.g., microscopy, cytometry, spectroscopy)

Project stage: ☐ Concept ☐ Prototype ☐ Production

Input Laser Details:

Power per channel (mW / W):

Beam quality (M^2 , if known):

Input type: ☐ Free-space ☐ Fiber-coupled

If fiber-coupled: fiber type / core size / NA:

Laser Configuration:

Wavelengths (nm):

☐ 405 ☐ 450 ☐ 520 ☐ 565 ☐ 670 ☐ Other

Number of lasers:

Power per laser:

Wavelength Requirements

Number of wavelengths:

Wavelengths (nm):

Linewidth (if applicable):

CW or pulsed sources:

Output Requirements

Output fiber type: ☐ SM ☐ PM ☐ PCF ☐ Other

Required PER (if applicable):

Output power (total):

Connector type (if required):

Performance Targets

Maximum acceptable insertion loss:

Polarization requirements:

Stability requirements (thermal / mechanical):

Mechanical & Environmental

Packaging constraints (size/format):

Operating temperature range:

Environmental conditions: ☐ Lab ☐ Industrial ☐ Field

Integration Details

Space constraints:

Mounting requirements:

Preferred fiber lengths:

Volume & Timeline

Estimated annual volume:

Prototype quantity:

Target timeline: