



Beam Splitters/Combiners

User Manual

Version 1.0.2

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Overview

1.1 Doric Beam Splitters/Combiners

Doric Lenses manufactures large quantities of low angle of incidence, high quality **Beam Splitters/Combiners**. This document describes this product line, as well as general operation guidelines for these products.

1.1.1 Doric Mini Cubes

The *Doric Mini Cube* contains an optical system that separates a beam into two output beams. The **Intensity Division** model (Fig. 1.1) splits the input beam into two output beams of equal power. The standard product is designed for use in the visible spectrum (400-700 nm wavelength). The cube can only be effectively used as a splitter; used as a combiner it will cause significant loss of beam intensity. The standard model uses an FC connector receptacle.



Figure 1.1: Doric Mini Cubes, Intensity Division

The **Wavelength Division** model (Fig. 1.2a) combines two input beams of different wavelengths into a single beam containing both wavelengths. The wavelengths are combined using a dichroic mirror. This system can be used in reverse to separate two wavelengths. The standard model uses an FC connector receptacle.

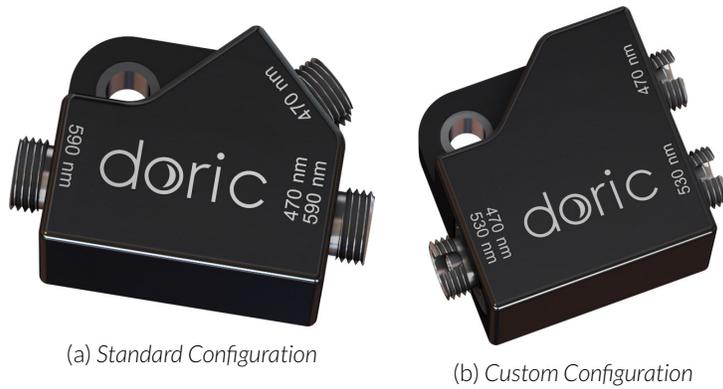


Figure 1.2: Doric Mini Cubes, Wavelength Division

The most popular configuration (shown in Fig. 1.2a) splits/combines light at 470 nm and 590 nm wavelengths. Custom wavelength requests are possible.

1.1.2 Doric Micro Splitters

The *Doric Micro Splitters (DMS)* is a reduced form-factor pigtailed splitter to avoid the need for a connector receptacle. Custom fiber-optic types can be chosen from the list shown in the [Catalog](#).



Figure 1.3: Doric Micro Splitters

Both models, **Intensity Division** and **Wavelength Division**, have an identical appearance (Fig. 1.3). The **Intensity Division** model is designed for use at wavelengths between 450 and 650 nm. The **Wavelength Division** model comes standard for splitting 470/590 nm light, though custom wavelength pairs are available.

1.1.3 Light Intensity Distributor

The *Light Intensity Distributor* is a small form factor intensity splitter with 3 (Fig. 1.4a) or 4 (Fig. 1.4b) equal-intensity output channels with low polarization dependant loss. This is due to the low angle of incidence allowed by the pentagonal geometry. The distributor is designed for use with multimode fibers only.



Figure 1.4: Light Intensity Distributors

FC connector receptacles are standard with the distributor, though custom requests are available. The distributor is optimized to work in the visual spectrum (450-650 nm). The intensity percentage leaving each output channel is typically 80% divided by the number of channels, assuming the use of identical fibers at each output/input.

1.1.4 Light Spectrum Mixers

The *Light Spectrum Mixers* allow the combination of multiple signals with different wavelengths. The mixers can be used in the opposite direction as a wavelength splitter for wideband light sources. They come in 3 (Fig. 1.5a) and 4-channel (Fig. 1.5b) models.



Figure 1.5: Light Spectrum Mixers

The standard model uses FC connector receptacle, though custom connectors are available on request. The standard 3-channel model combines 470/530/590 nm light while the standard 4-channel model combines 405/470/530/590 nm light, using a series of high-pass dichroic filters (see Fig. 1.5). Custom wavelength requests are possible.

Operations Guide

2.1 Getting Started

The usage of Doric Splitters/Combiners is extremely simple.

1. The *Doric Mini Cubes*, *Light Intensity Distributor* and *Light Spectrum Mixer*, have a screw hole to secure them within a system. The hole accepts 3/16 (or M5) screws.
2. When not in use, place the plastic cap on the FC connectors for protection and cleanliness.

2.2 FC Connector Use

1. Clean the optical fiber connector before insertion. Use isopropanol and a lint-free wipe.
2. With an FC connector, the connector key must be oriented to enter within the receptacle slot to ensure proper connection (Fig. 2.1).

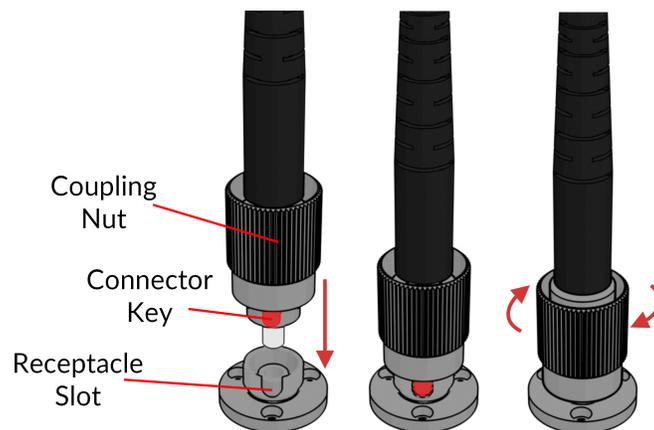


Figure 2.1: FC connector, Fiber Installation

⚠ To reduce the risk of eye injury, **it is sound practice to NOT CONNECT/DISCONNECT OPTICAL FIBERS when the light source is turned on.**

Specifications

3.1 Specifications

Table 3.1: *General Specifications*

SPECIFICATIONS	VALUE	NOTES
Input/Output NA	0.22 to 0.50	Performance may vary depending on configuration
Input/Output Fiber Core Diameter	50 to 600 μm	Performance may vary depending on configuration

Table 3.2: *Doric Mini Cubes: Intensity Division Specifications*

SPECIFICATIONS	VALUE	NOTES
Output Power	40 %	Tested with 0.22 NA, 200 μm core fiber, input power=100%
Output Power difference	<5%	Tested with 0.22 NA, 200 μm core fiber, output 1 vs. 2

Table 3.3: *Doric Micro Splitters: Intensity Division Specifications*

SPECIFICATIONS	VALUE	NOTES
Output Power	30 %	Tested with 0.22 NA, 200 μm core fiber, input power=100%
Output Power difference	<5%	Tested with 0.22 NA, 200 μm core fiber, output 1 vs. 2

Table 3.4: *Recommended Environmental Specifications*

DESCRIPTION	OPERATION	STORAGE
Use	Indoor	Indoor
Temperature	0-40 ° C	0-40 ° C
Humidity	40-60% RH, non condensing	40-60% RH, non condensing

Support

4.1 Maintenance

The product does not require any maintenance. Do not open the enclosure. Contact Doric Lenses for return instructions if the unit does not work properly and needs to be repaired.

4.2 Warranty

This product is under warranty for a period of 12 months. Contact Doric Lenses for return instructions. This warranty will not be applicable if the unit is damaged or needs to be repaired as a result of improper use or operation outside the conditions stated in this manual. For more information, see our [Website](#).

4.3 Contact us

For any questions or comments, do not hesitate to contact us by:

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