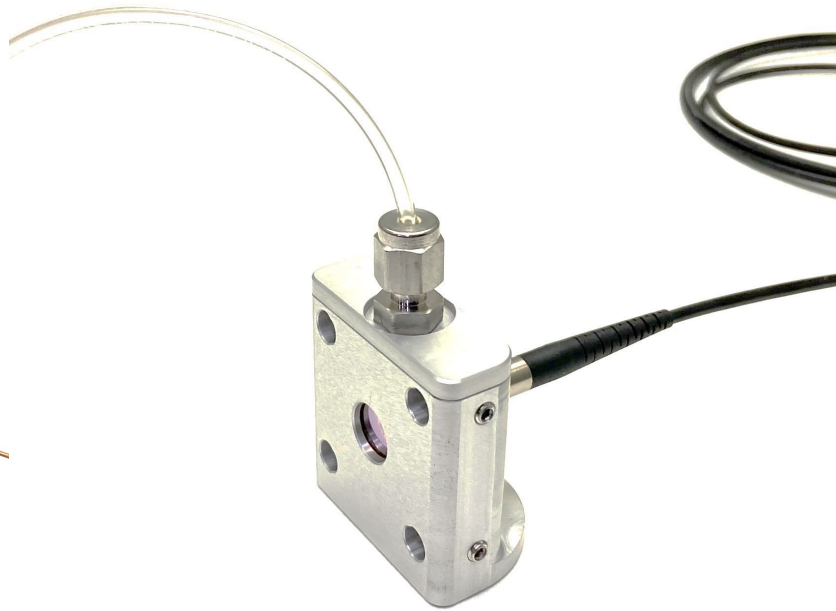


Gas Cell Block

Technical Reference Document GCB_V4.0



Gas Tight Version



SMA Version

GUIDING
PHOTONICS



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<https://guidingphotonics.com>

General Fiber Care and Precautions

In general, hollow core fibers are relatively robust compared to other infrared fibers; however, care should be taken to prevent damage to the fiber.

Unlike, solid core fibers, **hollow fibers cannot be polished.**

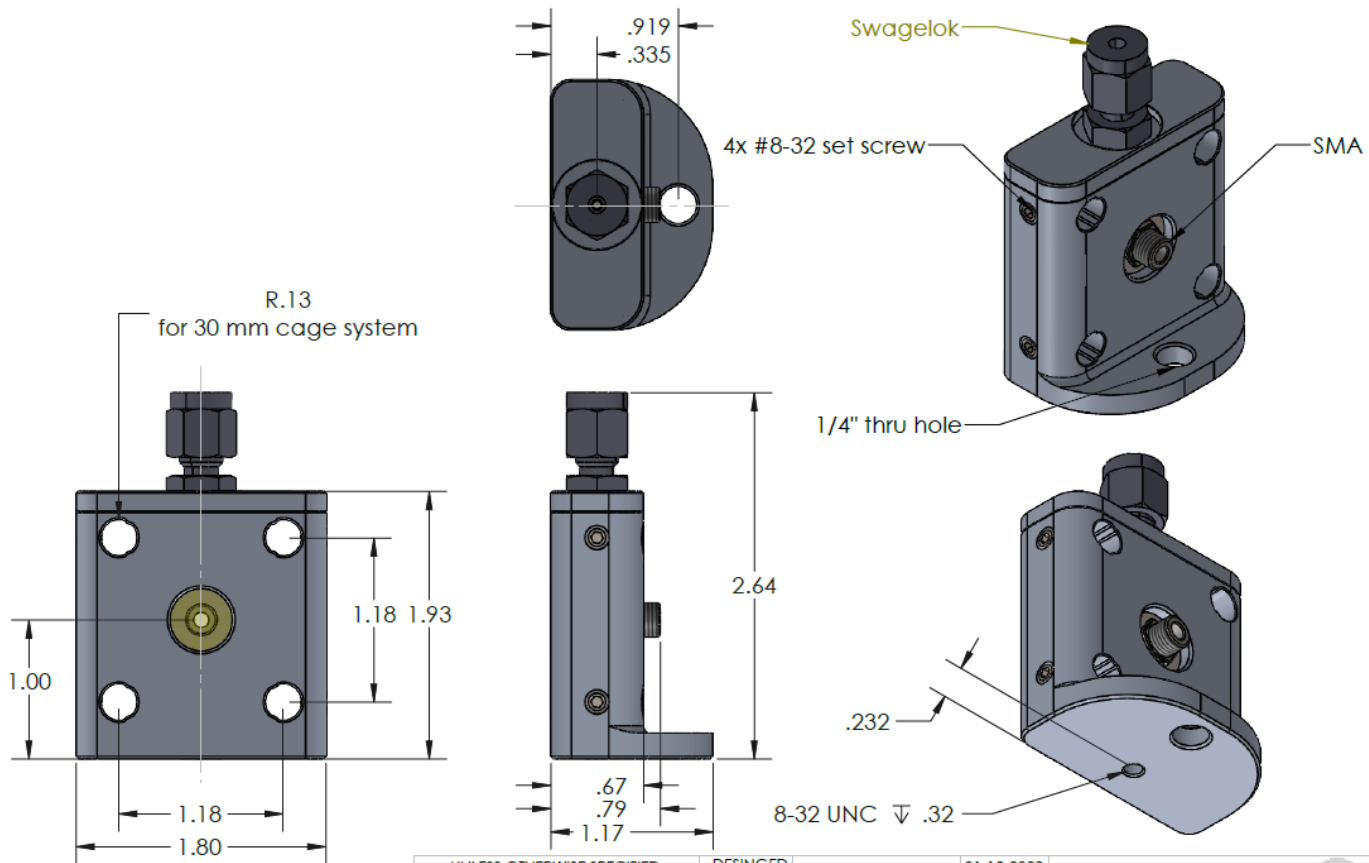
Avoid dust or debris as it may clog the fiber. If you suspect the fiber is clogged, you may try using suction (e.g., a vacuum cleaner) and/or blowing across the tip with dry nitrogen or an inert gas. We do NOT recommend using “canned air” or “gas duster”, as these contain propellants with potentially unwanted IR absorption features.



Initial alignment should always be conducted at reduced power ($P < 100$ mW) to avoid focusing a relatively intense beam onto the fiber wall. Once the alignment is optimized and the beam is appropriately focused into the hollow portion of the fiber, then it is safe to increase the power. The maximum power limit depends on the fiber ID and can be found here:

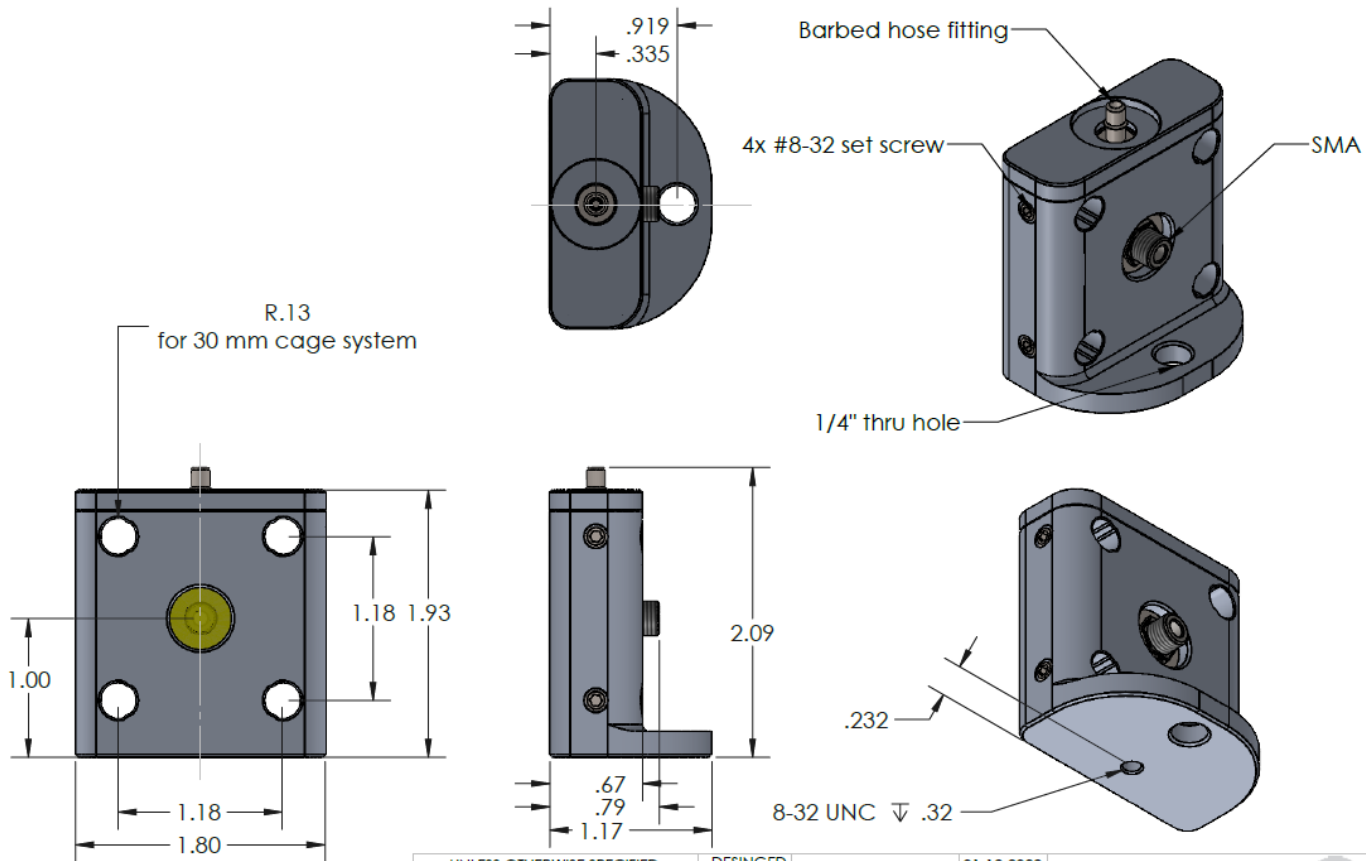
<https://guidingphotonics.com/mid-infrared-mid-ir-fiber-optic-solutions/#specifications>

SMA Gas Cell Block with Swagelok Gas Fitting



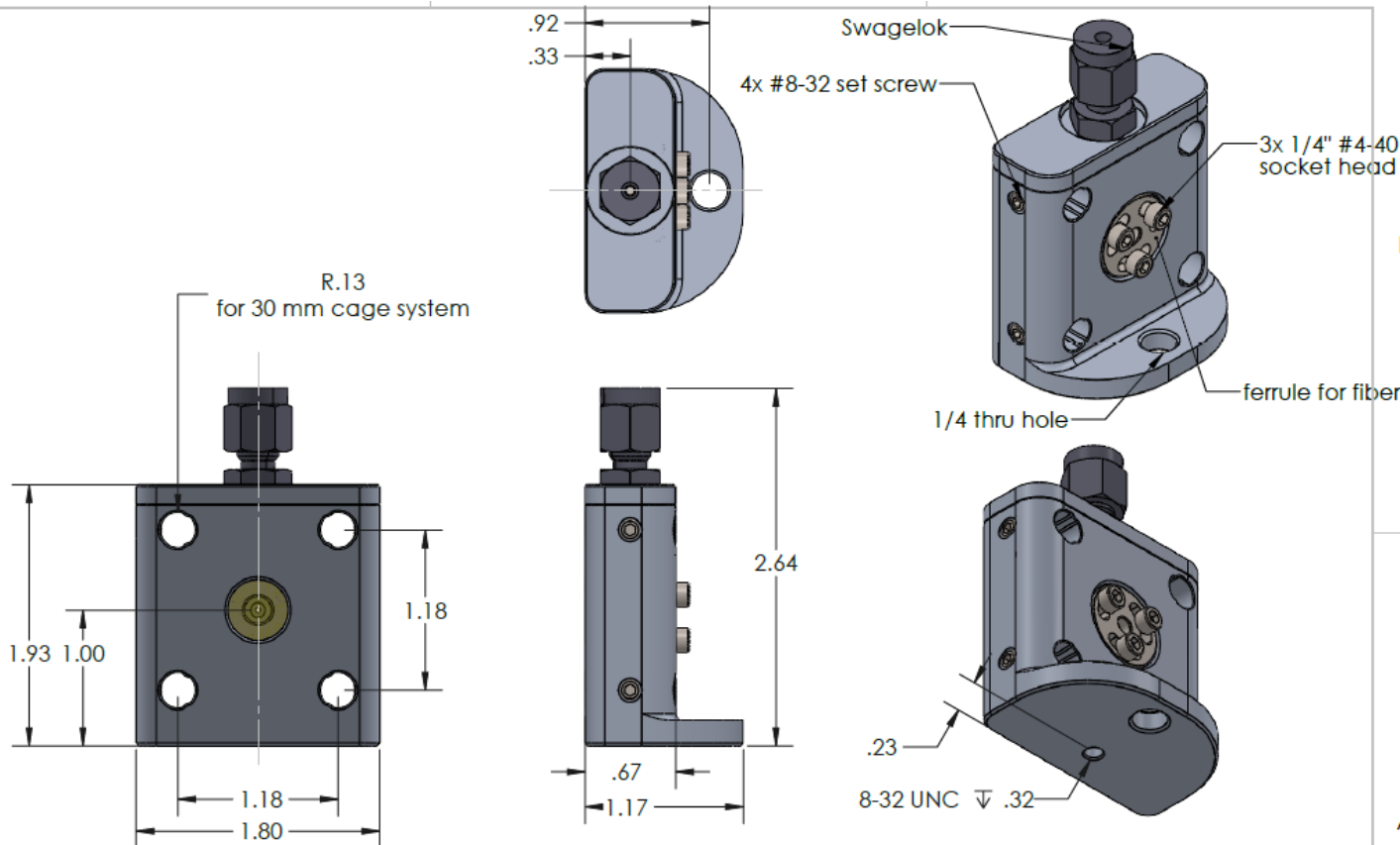
UNLESS OTHERWISE SPECIFIED:		DESIGNED	01-12-2022		
DECIMALS	ANGULAR	CHECKED			
.X ± .1	± 25°	APPROVED			
.XX ± .01	± 5°	TITLE:		Cell Block (Swagelok)	
.XXX ± .005		DWG. NO.		SIZE	SCALE
INTERPRET PER ASME Y14.5-2009		264-002-001		A	1:1
MATERIAL	Aluminum 6050 & SS 316	UNITS		in.	REV
FINISH	Clear anodize	A		SHEET 1 of 1	


SMA Gas Cell Block with Barbed Gas Fitting



UNLESS OTHERWISE SPECIFIED:		DESIGNED		01-12-2022		
DECIMALS	ANGULAR	CHECKED				
X ± .1	± 25°	APPROVED				
.XX ± .01	± 5°	TITLE:				
.XXX ± .005					Gas Cell Block (Barbed)	
INTERPRET PER ASME Y14.5-2009		DWG. NO.	264-002-002	SIZE	A	
MATERIAL	Aluminum 6050 & SS 316	SCALE	1:1	UNITS	in.	
FINISH	Clear anodize	REV	A	SHEET	1 of 1	

Gas Tight Gas Cell Block with Swagelok Fitting

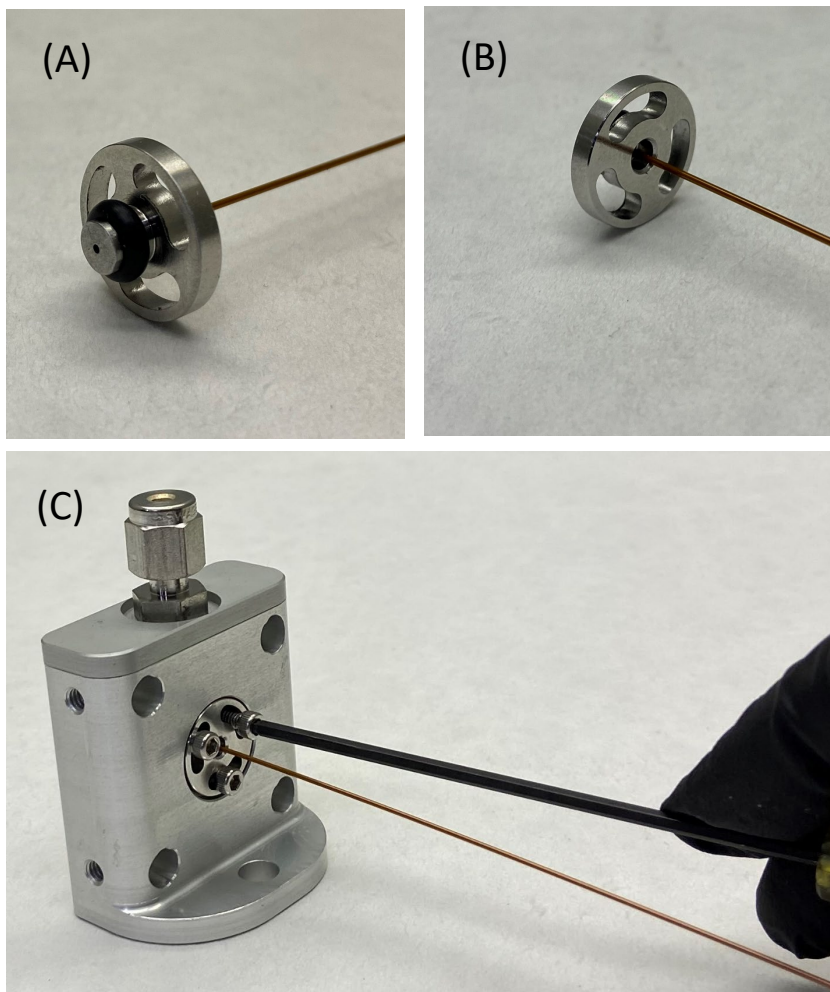


UNLESS OTHERWISE SPECIFIED:		DESIGNED	06/2022		<div>GUIDING PHOTONICS</div> 	
DECIMALS	ANGULAR	CHECKED				
.X ± .1	± .25°	APPROVED				
.XX ± .01	± 5°	TITLE: Gas Tight Gas Cell Block				
.XXX ± .005						
INTERPRET PER ASME Y14.5-2009		DWG. NO. 264-003-001				
MATERIAL Aluminum 6050 & SS 316						
FINISH	Clear anodize	SIZE	SCALE	UNITS	REV	SHEET 1 of 1
		A	1:1	in.	A	

Fiber Attachment (Gas Tight Version Only)

Bare fibers must be epoxied into a fiber ferule for use with the gas cell block. If blank ferules are provided, these must be drilled out to an appropriate inner diameter that is slightly larger than the fiber outer diameter.

(A) When gluing the fiber into the ferule, carefully align the end of the fiber with the front of the ferule. (B) Additional epoxy can be added at the back of the ferule to secure the fiber in place. (C) Once the fiber is in place, the ferule can be attached to the block with 3 screws.



Improper installation of the fiber may lead to gas leaks.

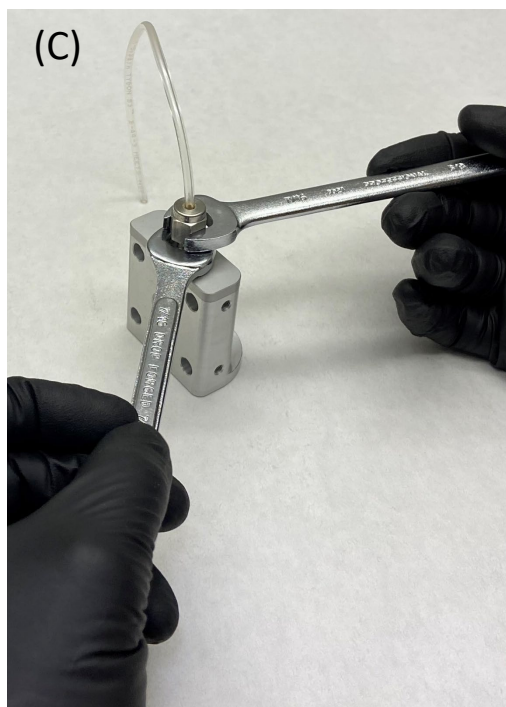
Gas Connections (Swagelok Style-only)

For Swagelok style gas connections, proper installation, attachment, and removal procedures must be followed. (A) The ferrules should be preswaged onto the tubing using a separate Swagelok fitting. (B) The preswaged tube can then be attached to the Gas Cell Block and hand-tightened. (C) Following these steps, a second wrench must be used to hold the base of the fitting while tightening according to Swagelok recommendations (generally $\frac{3}{4}$ turns). In addition, two wrenches must be used to loosen the fitting prior to removal.

See: <https://www.swagelok.com/downloads/webcatalogs/en/ms-13-151.pdf>
If there are any questions, please contact: sales@guidingphotonics.com



Preswage the fitting prior to installing

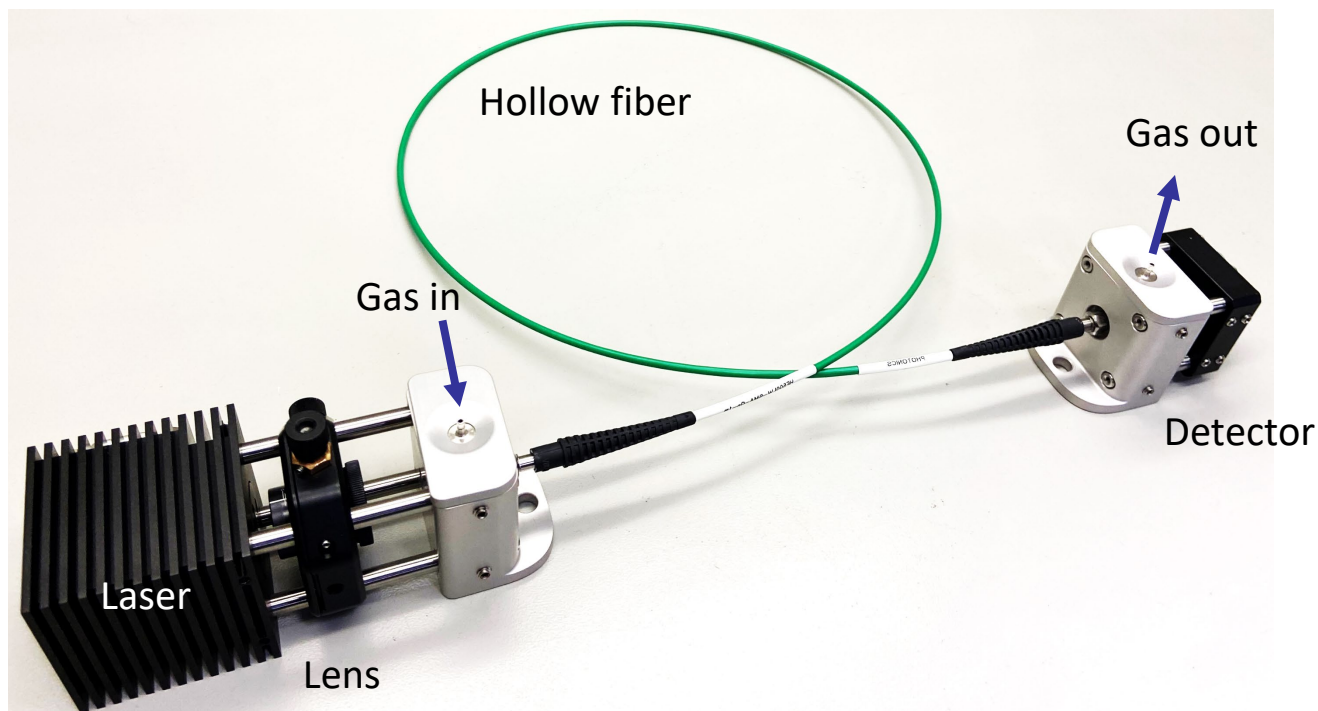


Always use a 2nd wrench to hold the fitting at the base and do not overtighten



Improper installation of gas fittings may damage the Gas Cell Blocks and will void the warranty.

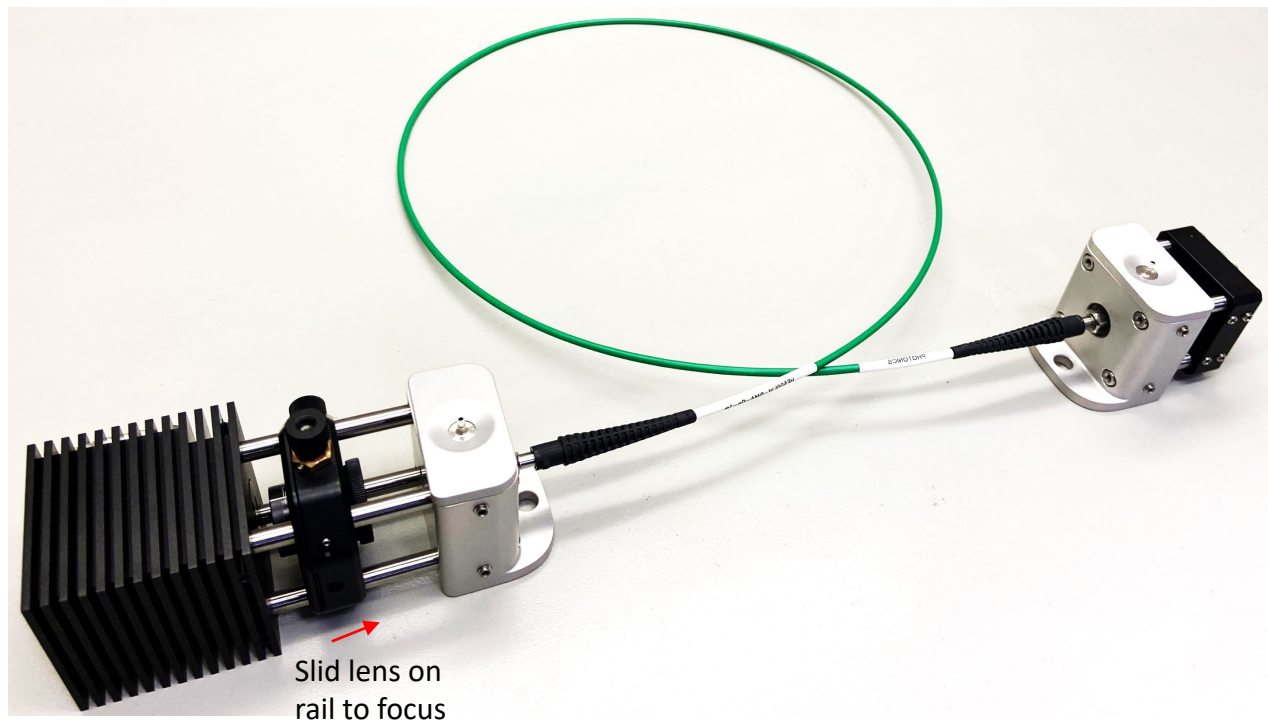
Example use of cell blocks for laser spectroscopy



Gas cell blocks include an optical window, a fiber port, and a gas port. With two blocks you can convert a hollow fiber into a bench top gas cell for absorption spectroscopy or wavelength reference applications. Simply swap fibers for different path lengths.

The relatively large fiber diameter (ID = 0.2 - 1.5 mm) and single pass configuration enables obtaining 'first light' with minimal effort. In some cases, you can collimate your beam and mount your laser on one end and simply put your detector at the other end. It is that easy.

Optical alignment



The cell blocks include features to accommodate optical assemblies mounted using 30 mm rail systems. One example is shown above in which both a laser and coupling lens are mounted on one gas cell block.

In cases where the laser is not cage mountable, then the gas cell should first be aligned with the laser beam without the fiber in place. Once the beam and the cell block are on the same optical axis, then the fiber should be installed, and alignment continued.

Note: there will be fluctuations in the signal due to fiber movement, so it is recommended that the fiber is kept still/fixed during the alignment process. In addition, maximum transmission will occur with the fiber kept straight.

If there are any questions, please contact:

sales@guidingphotonics.com