Wavelength REFERENCES

# Spectrometer or FTIR Gas Flow Cells

The FCM flow cells are optimized for spectrometers and FTIRs and can also be used with tunable laser systems. They are compatible with fiber with a core diameter of up to 1mm and a NA of 0.37 with a SMA905 connector. To accommodate fibers commonly used in the industry. The cells use large diameter CaF2 lenses for efficient coupling over an extreme wavelength range from 150nm to 9 microns.

The cells are housed in a rugged vacuum tight enclosure of either hard anodized aluminum or 316 stainless steel. Pressure handling capabilities >400psi, inert wetted surfaces, >200°C operating temperature, and Swagelok fittings provide for versatile and durable applications.

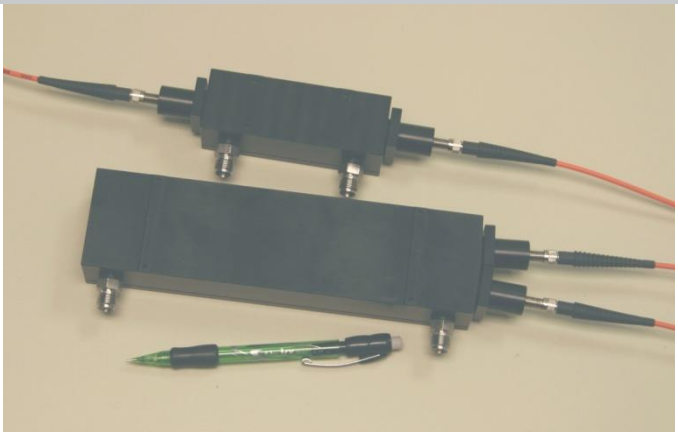
The 10cm path cell is designed as a single pass-through. The 40cm path version is designed as a two pass with an internal front surface mirror (aluminum or gold) and both connectors on one side.

## Specification

| Parameter | Units | |
|---|---|---|
| Wavelength Range[1] | nm | 150 to 9000 |
| Fiber Interface | | SMA905 |
| Fiber Compatibility | | To 1mm core and 0.37 NA |
| Actual path lengths | cm | 10 (FCM-10), 40 (FCM-40) |
| Operating temperature | °C | -50 to +200 |
| Fiber to fiber throughput[2] | % | >50 FCM-10<br>>35 FCM-40 |
| Fiber to fiber throughput over temperature | % | < 10% change from 25°C |
| Spectral ripple (P-P) | dB | <0.01 P-P in any 2nm span |
| Wetted surfaces FCM-10-AL[3] | | Hard anodized aluminum, 316 SS, gaskets, CaF2 |
| Wetted surfaces FCM-40-AL[3] | | Hard anodized aluminum, 316SS, gaskets, CaF2, B270 glass, epoxy |
| Gasket material | | Viton (viton extreme or Kalrez available) |
| Storage temperature | °C | -40 to +200 |
| Swagelok® fitting style | | 1/4" or 1/8" tube, hose bib available |
| Leak rate | Atm-cc/sec | $<10^{-6}$ |
| Cell Pressure | MPa | 0 to 3(430psi) FCM-10<br>0 to 2(290psi) FCM-40 |
| Cell volume | cc | 17 FCM-10<br>110 FCM-40 |

**Notes:**

1. For FCM-40 we use a protected aluminum mirror for the UV-optimized cell and a protected gold mirror for the IR-optimized cell.
2. At 25°C and 650nm using 200 micron core 0.22 NA fiber.
3. FCM-SS has no anodized aluminum; only 316SS.



## Features

- **Wavelength operation from 150nm to 9 microns**
- **Designed for minimum optical interference artifacts**
- **Compact multi-pass design for low concentrations/weak absorption lines.**
- **Swagelok® fittings for easy integration**
- **Low cost**

## Applications

- **Gas sensing systems from the deep UV to the Mid-IR**
- **Spectroscopic research**
- **Chemical detection systems**

## Ordering Information (example)

**FCM - 40 - ¼ - SS - UV**

Path length:
10- 10cm
40- 40cm

Swagelok® tube style:
1/4 – ¼" tube
1/8 – 1/8" tube

Cell Body:
SS: 316 stainless steel
AL: Anodized aluminum

Wavelength Region:
UV- optimized for UV
IR-optimized for IR
Note both versions will work over entire wavelength range with some reduction in throughput

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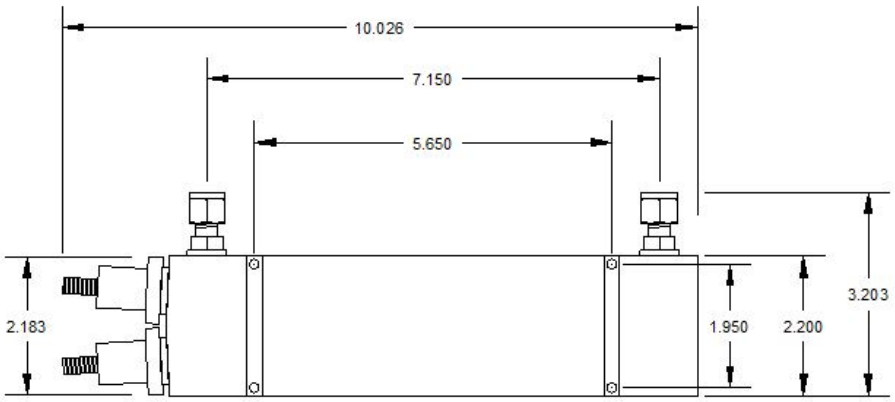
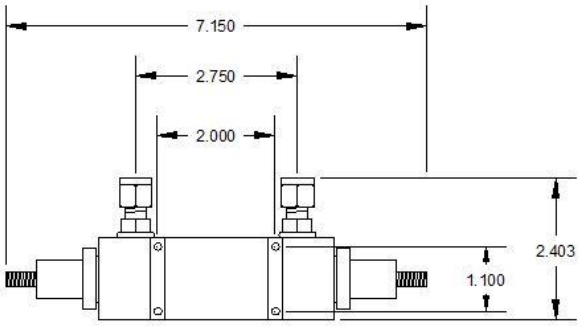
# *Package Drawings*

## *40 cm path*




Dimensions: inches

## *10 cm path*




Dimensions: inches

**Flowcell operation:**

Wavelength References Flowcells are very simple to use. For best results, however, note the following:

1. The cell is provided with four mounting holes tapped with 4-40 threads on the bottom.
2. Do not apply mechanical stress on the endcaps. These hold the CaF2 collimating lenses.
3. If you require valves on the cell inquire as these can be provided, we can offer high quality needle or diaphragm valves.
4. Prevent dust and condensation from entering the cell. Uniform heating can reduce condensation and aids in moisture removal from the cell surfaces. Initial pump down with some heating is very beneficial for low background water vapor.
5. If the cell optics are damaged due to contamination we can rework the cell for lifetime cost savings. Please contact factory.