

# Multipass Gas Cells

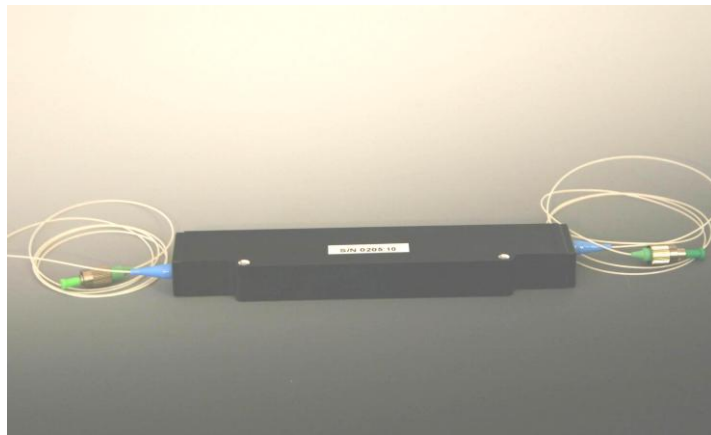
## Wavelength Standard Sensing system reference

Gas cells are precision filters whose absorption lines wavelengths are determined by molecular energy levels. These absorption lines have unparalleled traceable accuracy and stability over environment and time.

Carbon monoxide gas absorption has been widely researched and identified by national standards bodies as a primary wavelength reference in the band 1560nm-1630nm. We offer NIST traceable carbon monoxide cells.

The cells feature a 80 cm absorption path in a compact multipass housing. The cells can be ordered with almost any pure gas or gas mixture for use in a chemical sensing system as a local reference

The cells are also offered in an instrument housing with bulkhead optical connectors for extra protection and convenience in a laboratory setting. Up to three cells can be placed in one housing.



## Specifications

### General

Optical Path	cm	80 (5 pass design)
Optical fiber		SMF28 input and output (S option) SMF28 in multimode out (M option)
Optical insertion loss (25 degC)	dB	<3.5
Insertion loss temperature dependence 0 to 60 degC	dB	<±1.5 (M, SM option), <±2.5 (S Option)
Optical return loss	dB	>30dB (M option), >50dB (S option)
Operating Temperature	degC	0 to 65 (+10 to 65 water cell)
Gas pressure	Torr	<750 <sup>2</sup>
Spectral ripple	dB	<0.1 dB P-P in any 5nm span
Cell lifetime	year	>10
Cell Size	cm	18 X 3.7 X 1.8

### Carbon monoxide Lines

Wavelength Range	nm	1560-1597 carbon12 1594-1638 carbon13
Wavelength Accuracy	pm	±0.1 (varies with line)
Temperature dependence	pm	<0.01 pm/degC
Absorption depth	dB	0.8dB one isotope present 0.4dB both isotopes present

### Combination cells

<sup>12</sup> CO + <sup>12</sup> CN	nm	1518-1595
<sup>12</sup> CO + <sup>13</sup> CO + <sup>12</sup> CN	nm	1518-1638
<sup>12</sup> CO + C <sub>2</sub> H <sub>2</sub> + H <sub>2</sub> O	nm	1330-1595
Other Combinations available		

- Specifications subject to change without notice
- Minimum linewidth at pressures <100Torr is 0.005nm. Match pressure to application for best performance

## Features

- Reliable hard sealed tube, >10 year life
- AR coated optics, wedged windows for low level of interference effects
- Rugged package
- Available with fiber in/out or with built in photodiode
- Custom pressure, combination gas cell
- Extend wavelength range of gas cell to C + L band or S-band

## Applications

- Calibration lab source
- Sensing systems
- Embedded calibrator for tunable laser
- Embedded calibrator for OSA, tunable filter
- Wavelength locker

## Ordering Information (example)

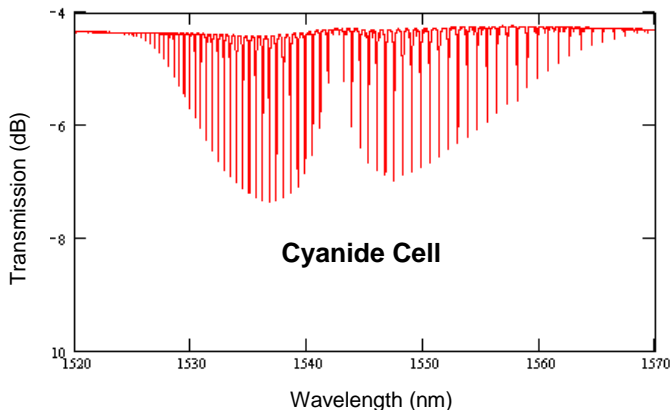
CO+HCN - 12/12 - S(80cm path) - 200/5 - None

<b>Type:</b> Carbon monoxide: CO Add HCN: CO+HCN Add C <sub>2</sub> H <sub>2</sub> : CO+C <sub>2</sub> H <sub>2</sub> Other: inquire	<b>Isotope:</b> Carbon 12: 12 Carbon 13: 13	<b>Pressure:</b> Torr: CO (+HCN)	<b>Connector:</b> FCPC FCAPC SCPC SCAPC None
	<b>Style:</b> Single mode in and out: S Single mode in multimode out: SM Single mode with photodiode: SP		

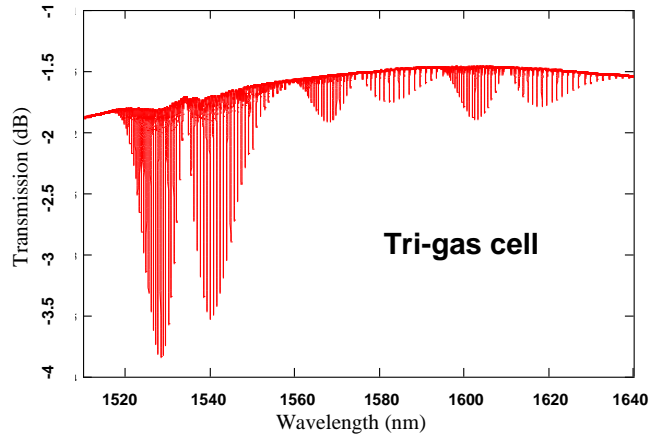
**Wavelength References Inc**

## Wavelength References

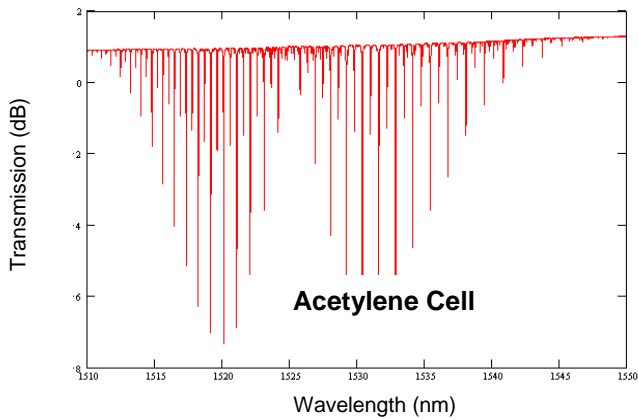
33809 SE Eastgate Circle  
Corvallis, OR 97333 USA  
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Email: sales@wavelengthreferences.com



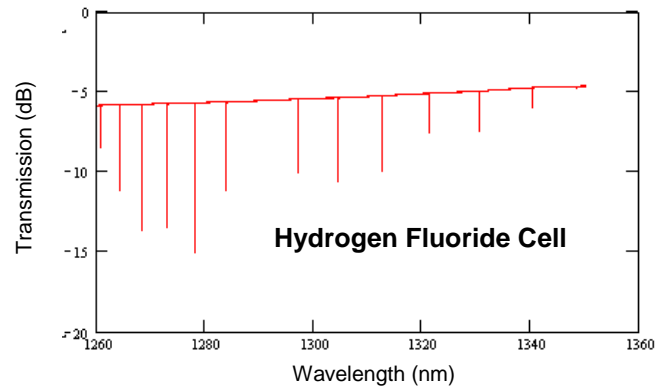
- Cyanide gas cell is SRM 2519 equivalent
- Dimensions are 18.5cm X 2.4cm X 1.3cm for the standard cell and 7.2cm X 1.4cm X 1cm for the mini HCN cell in the 5cm path package



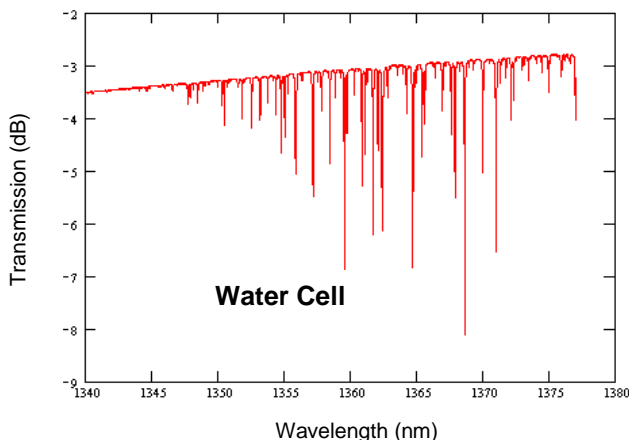
- Tri-gas cell is unique to Wavelength References. Gases are C12 hydrogen cyanide, C12 and C13 carbon monoxide
- Dimensions are 18.5cm X 3.7cm X 1.8cm



- Acetylene gas cell is SRM 2517 equivalent
- Dimensions 4.7cm X 1.4cm X 1cm



- Hydrogen Fluoride cell is unique to Wavelength References
- Dimensions 5cm X 2.4cm X 1.4cm



- Water vapor cell has lines throughout S-band from 1330 to 1500nm
- Dimensions 18.5cm X 3.7cm X 1.8cm in our multipass 80cm path and 18cm X 2.4cm X 1.3cm in our 16.5cm path package

Gas cell spectra shown are the most popular versions but are only samples of the large array of gases that we have dealt with. In addition to fiber coupled versions we also supply bare glass tubes filled with many pure gases and gas mixtures.

We pride ourselves on the low ripple of our gas cells. Ripple is generally caused by parasitic etalons in the optical path. We use all coated wedged and tilted optics to minimize these effects as can be seen by the spectra examples.

Our cells with withstand severe environmental conditions and have been tested and are used by many of the major test and measurement companies in the fiber optic industry. In addition our devices find application in university and other research and diverse sensing areas

Popular versions ordering information:

- C2H2-12-M-F-200-FCPC (200Torr fiber coupled acetylene cell)
- HCN-13-C-100-FCPC (100 Torr fiber coupled cyanide cell)
- CO+CO+HCN-12/13/12-C-150/150/5-FCPC ( fiber coupled Tri-gas cell)