

### Free Space Absorption Tubes General Info Sheet

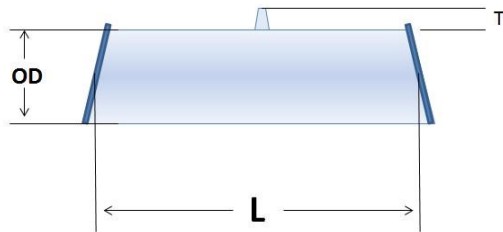
Our free space absorption tubes come in a wide variety of configurations to suit our customers' needs across several industries including gas sensing, calibration and research. Due to the large number of configurations this info sheet was created to help our customers determine what absorption tube best fits their needs.

Please answer the following questions to help us generate a quote as efficiently as possible. What you are unsure of just leave blank and we will try to make a recommendation. It is not necessary to enter all the fields (example: if you know what gas, pressure and length cell you want, the absorption depth and width are predetermined). You may copy and paste into an email or fill out this form directly. The sections below provide additional details:

1. Tube parameters: Outer diameter \_\_\_\_\_ (alternately, clear aperture requirement \_\_\_\_\_)
2. Tube parameters: Length \_\_\_\_\_
3. Wavelength range: \_\_\_\_\_
4. Gas species (for HF please contact us directly): \_\_\_\_\_
5. Concentration (100% if pure gas): \_\_\_\_\_
6. Total pressure (<740 Torr): \_\_\_\_\_
7. Target absorption depth (note wavelength): \_\_\_\_\_
8. Target width / picometer resolution: \_\_\_\_\_

Of course, if you have any questions, please don't hesitate to contact us: [sales@wavelengthreferences.com](mailto:sales@wavelengthreferences.com) or 541-738-0528.

#### Tube Parameters



Description	Abbr.	Standard Specs
Path Length (does not include windows)	L	2.5cm, 5.0cm, 10cm (1cm to 40cm available)
Length Tolerance		+/- 0.2cm
Outer Diameter	OD	12mm, 25mm
Clear Aperture	CA	9mm, 21mm
Stem Tube	T	< 8mm
Wedge		0.3 degrees nominal
Tilt		3 degrees nominal
Window Thickness		1.5mm nominal
Window Material		B270 glass, MgF2 (see below)
Tube Material		Soda lime glass
Lifetime		>10 years

### Wavelength Range / Window Material

The application wavelength range determines the window material:

< 2.6 microns: AR-coated glass

< 8 microns: Magnesium Fluoride

} Windows are fritted creating a true hermetic seal

Contact us or visit our website for transmission spectra and more details.

**NOTE:** Glass windows are left square but can be rounded upon request. MgF2 windows are round.

### A Note on Pressure and Concentrations

Our ability to test for absorption in our tubes guarantees accuracy and stability. Gases that exhibit > 0.04 dB (1%) absorption in the near-IR (1300-1640nm) can be tested directly. For other tubes, we can often ensure it is sealed, resulting in good stability but potentially poor accuracy. This means that while the contents of the tube are to some extent unknown, the tube will exhibit consistent results throughout its lifetime.

Certain polar and reactive molecular gases in low concentrations or pressures can have additional accuracy concerns due to their "sticky" nature. These include ammonia (NH<sub>3</sub>), hydrogen chloride (HCl), and water (H<sub>2</sub>O). For these molecules, we find that the measured absorption can vary depending on both the contents of the tube (accuracy) and the extent to which the gas adheres to the tube surface (stability). For best results, we recommend using these cells in a controlled environment.