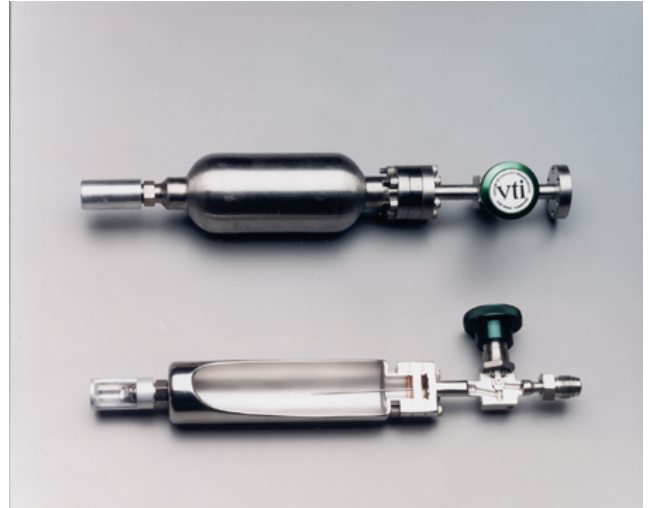




# The CL Model CAPILLARY CALIBRATED LEAKS (With Reservoir) FOR ALL GASES

VTI's CL Model Calibrated Gas Leaks have a stainless steel capillary that has been precision crimped to provide an accurate flow-rate restriction for any gas. The gas, under pressure in the reservoir, flows through the capillary restriction and into the system to which it is attached using one of the many fittings available. This yields a precise, known flow rate.

The CL models have an all-welded construction and use an all-metal shut-off valve making them unbreakable and bakeable for UHV applications. They also have a low temperature coefficient, approximately 0.2 % per degree C and are available in a wide range of leak rates. Caution should be taken when considering capillary leaks for flow rates smaller than  $10^{-6}$  atm-cc/sec, however, due to potential plugging of the leak. VTI takes care in the proper construction and processing during manufacture to insure a clean and stable flow of high-purity gas or gas mixtures.



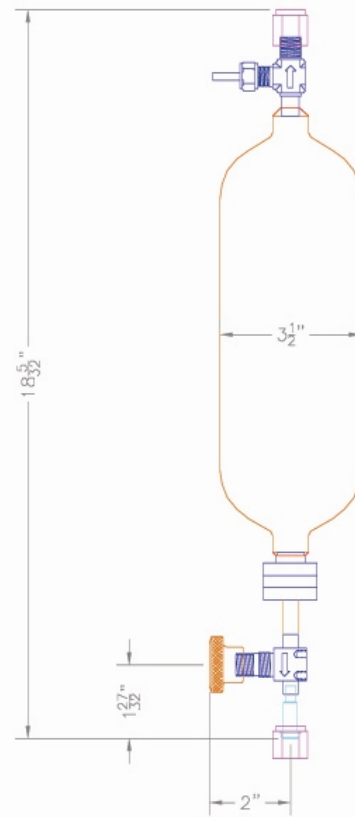
## Choosing the CL Calibrator

- CAN BE PROVIDED WITH ANY GAS: or mix.
- UNBREAKABLE: all stainless steel, all welded.
- WIDE LEAK-RATE CHOICE: typically  $10^{-7}$  to  $10^{-3}$  atm-cc/sec.
- STABLE: low temperature coefficient of 0.2% per °C.
- BAKEABLE FOR UHV USE: using all metal fittings.
- MEETS ISO REQUIREMENTS: NIST-traceable, A2LA-accredited Calibration Certification.



**VTI's Calibration Laboratory is Accredited by the American Association for Calibration Laboratory Accreditation.**  
Certificate No. 1707.01

As the major manufacturer of Calibrated Leaks for all gases, all leak rates, and all makes of leak detectors, VTI supplies them worldwide to users, distributors, and other manufacturers. These Accu-Flow™ Leak Standards are recognized internationally for their superior quality construction and calibration.



Typical CL assembly  
CL-X-BB-4FVCR-1000DOT-WFV.



# CALIBRATED LEAK STANDARDS FOR ALL GASES

## CL Capillary Leaks with Reservoir

### ORDERING INFORMATION

For an order or quotation for a CL Leak, please provide the Part Number and confirm the Outlet Fitting for connection to your system or part. It is also necessary to specify the Gas and specific Leak Rate with your preferred leak-rate units. In addition, the Manufacturing Variance ("Tolerance") that you can allow on that Leak Rate should be specified as +/- 40% (the normal allowance), or as +/- 15% (the "Special-Range Variance"), for which there is an additional cost and an "-SR" added to the part number. An example specification is  $2.0 \times 10^{-5}$  atm-cc/sec +/- 40%. In all cases, the leak rate provided will be as close as we can make it to your specified rate, and the actual rate, as calibrated, will be recorded on the Calibration Tag and the Certifications.

#### PART NUMBER BUILD-UP

The CL Part Numbers are constructed as follows:

#### **CL-X-BB-YYYY-ZZZZ-FVO**

where **X** = the code for the Leak Rate Range required,  
 where **BB** = the code for the Gas to be used,  
 where **YYYY** = the code for the fitting required \*,  
 where **ZZZZ** = the code for the Reservoir required,  
 and **FVO** = Fill Valve Option: **W**FV or **M**FV (Bakeable).

A fill valve is required for many gases other than Helium, Argon, Nitrogen, Carbon Dioxide, and Air. Due to the high gas depletion rates for leak rates of  $10^{-4}$  and  $10^{-3}$  atm-cc/sec, these leaks must also have a fill valve for all gases. Additionally, leaks in the  $10^{-3}$  range, and often in the  $10^{-4}$  range, have an integral pressure gauge installed to monitor the residual pressure and indicate when filling is necessary.

\* Except for Helium leaks, the fitting for  $10^{-7}$  atm-cc/sec and smaller leaks must be a VCR or Conflat flange. If you require a different fitting, an adapter can be purchased.

#### EXAMPLE GASES AVAILABLE

Please contact us with other gas requirements.  
**Helium (HE), Argon (AR), Nitrogen (N2), Hydrogen (H2), Carbon Dioxide (CO2), Oxygen (O2), Air (AIR), Methane (CH4), Sulphur Hexafluoride (SF6), Refrigerants ("R" #), Xenon (XE), Deuterium (D2), Mixed gases (MIX).**

#### EXAMPLE FITTINGS AVAILABLE

Please contact us for other fitting requirements.

Code:	Description:
4FVCR	1/4" Female VCR
4MVCR	1/4" Male VCR
MCFF	1.33" OD Mini Conflat Flange
2CFF	2.75" OD Conflat Flange
1/4T	1/4" OD Tube
KF16	3/4" OD ISO Flange
KF25	1" OD ISO Flange
KF40	1.5" OD ISO Flange
4MPT	1/4" Male Normal Pipe Thread

### LEAK RATE RANGES AVAILABLE and EXAMPLE PART NUMBERS

Leak Rate Ranges Available for the CL	Leak Range Code (X)	Gas Code (BB)	Outlet Fitting Code (YYYY)	Res' Size (cc)	Res' Code (ZZZZ)	Fill Valve	Example Part Number
1.0 to $9.9 \times 10^{-3}$ atm-cc/sec	3	AR	2CFF	1000	1000DOT	Yes	CL-3-AR-2CFF-1000DOT-MFV-1500PSI
1.0 to $9.9 \times 10^{-4}$ atm-cc/sec	4	N2	KF25	1000	1000DOT	Yes	CL-4-N2-KF25-1000DOT-MFV
1.0 to $9.9 \times 10^{-5}$ atm-cc/sec	5	HE	4MVCR	500	500DOT	No	CL-5-HE-4MVCR-500DOT
1.0 to $9.9 \times 10^{-6}$ atm-cc/sec	6	H2	MCFF	300	300DOT	Yes	CL-6-H2-MCFF-300DOT-MFV
1.0 to $9.9 \times 10^{-7}$ atm-cc/sec	7	XE	2CFF	215	215CC	Yes	CL-7-XE-2CFF-215CC-MFV

**Note:** Larger and smaller flow rates are possible. However, with leaks smaller than  $10^{-6}$  atm-cc/sec there is increased risk of plugging of the capillary and precaution in use should be taken. For all leak rates, the leak's shut-off valve should be kept in the closed position when the leak is not in active use.

A fill valve is required for H2, CO, CH4, SO2, NE, KR, D2, XE and HE3. Mixed gas leaks may also need additional calibration points.

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