



# Primary Standards Laboratory Humidity and Flow Project

## Fact Sheet

The Primary Standards Laboratory (PSL) maintains a wide variety of primary standards to assure accurate and traceable measurements for its customers. Capabilities include gas flow and humidity.

All the primary thermodynamic standards are directly traceable either to the Systeme International through the National Institute of Standards and Technology (NIST) or to fundamental quantities.

Gas flow measurements can be performed over a wide range of flow rates from a few milliliters/minute to 3000 liters/minute for a variety of flow standards and devices.

Frost/dew point can be measured to a few hundred parts per billion moisture and relative humidity from a few percent to 95 percent.

### Capabilities

Below is a representative sample of the PSL Humidity and Flow laboratory's uncertainties. The project is NVLAP accredited under Lab Code 105002-0 by the NIST/National Voluntary Laboratory Accreditation Program (NVLAP) in most of its capabilities. For full details, see <http://ts.nist.gov/standards/scopes/1050020.pdf>

### Humidity

Humidity Range	Uncertainty (k=2)
5% RH to 50% RH	0.5% RH
>50% to 95% RH	1.0% RH
-20°C to +20°C dew point	0.1°C
-80°C to +0°C frost/dew point	0.25°C

### Flow

Gas Flow	Range	Uncertainty (k=2)	Standards
Mass flow, nozzles, rotometers, laminar flow elements	50 SCCM to 20,000 SCCM  (0.05 SLPM to 20 SLPM)	0.5%	Brooks Flow Calibrator
Accumulations meters, turbine flow meters	20 SLPM to 1982 SLPM  (0.71 SCFM to 70 SCFM)	0.5%	Bell Prover
All gas flow devices	0.02 SLPM to 1.7 SLPM	0.92%	Gas Flow Calibration System, Laminar Flow Elements and Critical Flow Nozzles
	1.7 SLPM to 2265 SLPM	0.36%	



Thunder Scientific 4500 Humidity Generator

## Major Resources

- Thunder two-pressure automated humidity system
- Thunder automated frost point generator
- Bell prover for gas flow
- Brooks system for gas flow
- Gas flow calibration system



**Bell Volumetric Prover**

## Contacts

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