

# focus on Laboratory Products

## Precision Weights: Traceable vs. NVLAP\* Weight Calibration Certificates

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The question Troemner answers most frequently for our precision weight customers is; "What type of certificate do I need to meet the requirements for my laboratory?" A fundamental requirement for all laboratories is that the precision weights must be traceable to the SI unit for mass, the kilogram, and both Troemner's NVLAP\* Weight Calibration Certificate and Traceable Certificate include this information. The Traceable Certificate only provides traceability with a stated correction to the nominal value and the associated uncertainty. The NVLAP\* Weight Calibration Certificate provides more data that may be vital to your laboratory's measurement and weighing processes.

To determine what is needed for a laboratory, a review of the standards they are required to adhere to will stipulate how much information is necessary for their measurement devices, including precision weights. Laboratories need to review their standards, and answer these important questions.

### Do your requirements call for an internationally accepted quality standard?

Compliance to internationally recognised standards is important because this provides insight into the calibration process. The NVLAP\* Weight Calibration Certificate, unlike the Traceable Certificate, adheres to the strict requirements of numerous quality standards that are proven to meet the customer's needs. NVLAP\* Weight Calibration Certificates that meet the ISO/IEC 17025:2005 (General requirements for the competence of testing and calibration laboratories) and ANSI/NCSL Z-540-1-1994 (Calibration Laboratories and Measuring and Test Equipment – General Requirements) standards, demonstrate Troemner's quality processes are competent and support the scope of accreditation. This is accomplished through rigorous third-party independent audits of Troemner's quality systems and measurement assurance processes. The NVLAP\* Weight Calibration Certificate meets the requirements of these international standards for quality, and increases the level of competence for customers complying with the GMP and GLP requirements for their laboratories.

### Do your SOP's require documentation for the standards used and environmental conditions at the time of calibration?

Identification of the standards used allows the customer to view the type of mass comparator utilised for the calibration. Knowing the mass standards used, allows the customer to verify the right equipment has been operated to perform a competent calibration. The environmental data captured at the time of calibration is useful for the weight that was used to verify the balance. The air density at the time of calibration can be determined, and a correction for the customer's laboratory can be calculated. The greater the difference in the air densities results in a greater error on the balance.

### Lower uncertainties on the calibration matter?

Traceable Certificates have a higher uncertainty due to the nature of the calibration process. Weight calibrations performed by manual comparison will have an uncertainty component caused by the technician's interaction with the mass comparator. In contrast, NVLAP\* Weight Calibration Certificates for precision weights ranging from 1 milligram to 1 kilogram, are completed on a robotic mass comparator where the repeatability of the process becomes a smaller uncertainty factor than that of the manual calibration process. The robotic mass comparators provide the NVLAP\* Weight Calibration Certificate with lower uncertainties and a greater confidence in the measurements.

The table below compares these important considerations when deciding between a NVLAP\* Weight Calibration Certificate and a Traceable Certificate.

	NVLAP* Weight Calibration Certificate	Traceable Certificate
Traceability and Uncertainty	Traceable assigned corrections and uncertainty.	Traceable assigned corrections and uncertainty.
Uncertainty Value	Robotic calibrations guarantee low process variation and lower uncertainties.	Higher assigned uncertainty.
Internationally Recognised Standards	ISO/IEC 17025 and ANSI/NCSL Z-540-1 compliant with annual accreditation audits.  Audited by pharmaceutical companies to meet GLP and GMP requirements.  Weights are manufactured and calibrated to meet ASTM E-617 or OIML R-111 standards.	No compliance statement to any standard.  Calibrated to meet tolerance only.
Environmental Data	Environmental data is essential for precision weight measurements to determine error in the weight that is calibrated at standard air density of 0.0012g/cm <sup>3</sup> , but is then used at a different air density.	No environmental data is reported.
Standards Used Data	Defines Troemner calibration interval for the standards used for the customer calibration.	No standards used data.
Certificate Revision Level	The documented revision level is useful to demonstrate an unbroken chain of changes to the NVLAP* Weight Calibration Certificate.	No revision date  No detailed listing of changes to the certificate

\*NVLAP Laboratory Code 105013-0



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