

# Weights and Calibration Service



Calibration turnaround in  
**4** days  
or less

**RICE LAKE**<sup>®</sup>  
WEIGHING SYSTEMS  
To be the best by every measure<sup>®</sup>

[www.ricelake.com/precision](http://www.ricelake.com/precision)



## People Plus Precision

Rice Lake Weighing Systems' mass calibration laboratory has been awarded the NIST/NVLAP recognition of excellence. We are proud of our lab and our metrology staff. They continue to participate in NIST/OWM training seminars, regional metrology groups such as MidMap, and round-robin metrology programs with state labs. Most important: our people are proud of the reputation for excellence Rice Lake Weight Lab has earned. Rice Lake's calibration lab has direct traceability to NIST.

## Mass Metrology Laboratory

No matter the focus of your laboratory work, you are looking for repeatable proof. Your laboratory equipment and tools must be precise and efficient. You need accurate traceable weights. And you need calibration service that sends those weights back to your lab in days, not weeks.

Our metrology laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and respected throughout the country. We manufacture, calibrate, and certify mass standards and test weights from 1 milligram to 5,000 pounds with both traceable and calibration certificates.

Our calibration service turnaround time is unrivaled. Virtually all of our recalibration and certification services receive an industry-leading four-day turnaround. If you need a custom solution, we manufacture custom weight values and sizes. Our ISO/IEC 17025 and ISO 9000 compliant Precision Measurement and Metrology Division is globally recognized and trusted.

# Traceability

## What Is Traceability?

Traceability is documentation—essentially a pedigree—showing a direct link to the official U.S. 1 kg weight standards housed at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD. These NIST standards are, in turn, calibrated to the international 1 kg standard maintained at the BIPM lab in Sevres, France.

Traceability not only means that a weight or mass standard has links to the NIST 1 kg standard, but also that the measurements were appropriate for the accuracy class required for the application. Traceability also requires proof that all environmental factors affecting accuracy were considered at the lab performing the measurement.

There are two types of traceability: direct and indirect.

## Direct Traceability

Direct traceability means a weight or mass standard has been tested by NIST. NIST then issues a report number to the organization for which they have performed measurements. Because the certificate is valid only for the items tested by NIST, a calibration lab such as Rice Lake Weighing Systems must submit its set of mass standards to NIST for testing. This certificate provides direct traceability for the lab's mass standards, which can then be used in calibrating weights for clients.

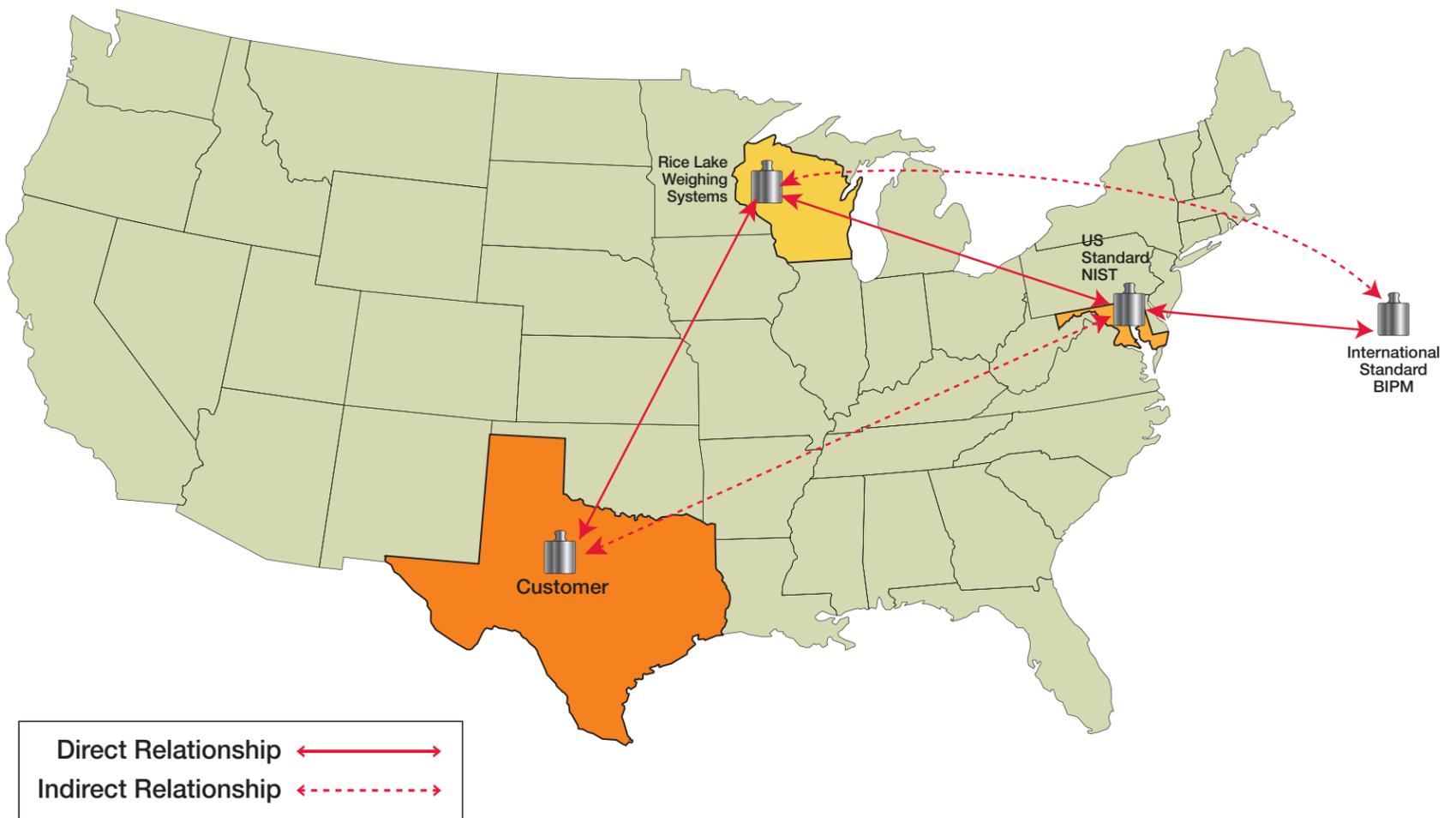
## Indirect Traceability

Indirect traceability exists when a metrology lab that has direct traceability and has the necessary measurement control program in place tests a client's weight or mass standard. An important aspect of this measurement control and testing program is the participation in a NIST-certified measurement assurance program, which reduces the possibility of errors.

To clarify the two types of traceability, remember that direct traceability comes directly from NIST. For example, Rice Lake Weighing Systems' Calibration Lab has direct traceability, as shown in the diagram below. The calibrations we perform for our customers provide indirect traceability. Likewise, when that customer uses its Rice Lake Weighing Systems calibrated test weights to calibrate a balance or scale, it is providing indirect traceability.

## When Is Traceability Necessary?

- Federal agencies require measurement traceability to national standards for contract work.
- Military contracts invariably require traceability.
- Pharmaceutical, scientific, and medical product manufacturers usually specify traceability.
- ISO-9000 registered companies nearly always require proof of traceability to the international standard.





## Test Weights

Rice Lake offers cast iron weights and three designs of stainless steel weights. Due to varying configurations, the actual appearance of your product may be slightly different than shown. Serial numbers are available for an additional charge when ordered without laboratory documentation. Individual leaf weights should be ordered with protective vial.

**Electronic balance weights** are Type II design featuring a sealing cavity for adjusting material in 100 g or larger weights. The density is approximately  $7.84 \text{ g/cm}^3$ . Finish for Class 1 is polished. ASTM Class 2-4 are satin. ASTM Class 1-4 are manufactured in accordance with ASTM E 617-97 specification and tolerances. Applications include calibrating Class I and II balances or ASTM Class 4, 5 and 6 weights.

**Precision weights (screw-knob design)** are Type II design with sealing cavity for adjusting material. The density is approximately  $7.95 \text{ g/cm}^3$ . ASTM Classes 1-4 have a polished finish. Applications include: calibrating Class I and II balances and ASTM Class 4, 5 and 6 weights, student laboratory use, and rough weighing operations: for example, force.





**Cast iron weights** are painted weights with an adjusting cavity for sealing. Weight capacities of 10kg/20lb and up meet NIST Handbook 105-1 and Handbook 44 specifications. Applications where cast iron weights are used include field standards for testing industrial devices. The classes are NIST Class F, ASTM Class 6 and 7, OIML Class M1 and M2.

**Aluminum weights** (not shown) are used for denominations of 5 mg to 1 mg and are in the one-piece precision design.

**Stainless steel weights** are available as Cylindrical, Electronic Balance, Grip-Handle, Precision (screw-knob or one-piece design).

**Precision laboratory weights** that are a Type I, (one-piece construction) have no added adjusting material. The density is approximately 7.95 g/cm<sup>3</sup>. ASTM Class 0 and OIML E2, F1, F2 have a polished finish. OIML M1 and M2 have a satin finish.

## Classifications

**ASTM Class 0 and OIML E1, E2, F1 and F2** sets and individual weights are not individually marked with their weight value and cannot be individually serialized per ASTM E 617-97. These weights include their own protective case.

**OIML weights** are manufactured to the specifications of the International Recommendation, OIML R 111, 2004 Edition. Applications include weights used as standards, density measurement, and balance calibration.

Cylindrical weights are **NIST Class F weights** manufactured to the specifications of NIST HB-105-1. The Type II design features a sealing cavity for adjusting material in 100g or larger weights. The density is approximately 7.84 g/cm<sup>3</sup>.

## Weight Kits

All cylindrical ASTM kits (excluding grip handle weights) include their own protective case and glove for safe handling.



Set shown in velvet-lined hardwood case

## Weight Sets

Rice Lake offers many configurations for their weight sets. Class F sets have configurations to assist in calibration of scales; higher accuracy sets are available in 5-2-2-1 and 5-3-2-1 configuration.

A standard set would be:

5-2-2-1 – (1) 50 g, (2) 20 g, and (1) 10 g

5-3-2-1 – (1) 50 g, (1) 30 g, (1) 20 g, and (1) 10 g

Custom sets are available as build-to-order to meet your specific requirements.

Each weight set consists of the weights, case and/or small weight case (as appropriate), and appropriate handling tools: lifter or tweezers and white cotton gloves.

OIML and ASTM weight sets larger than 500 grams or 1 pound include a hardwood case with velvet-lined pockets. Weight sets with the largest weight of 500 g include a precision-machined polyvinyl, crush-resistant case.

Serial numbers are not stamped on polished weights or milligram weights.

The correct class weight is dependent on the use. Weights should be more accurate than the precision of the weighing device, and it is recommended that a weight has an accuracy of one-third of the weighing device readability.

Set shown in plastic case



Set shown in precision-machined polyvinyl case



Set shown in ABS plastic case



# Calibration Services

## Selecting Mass Standards and Test Weights

If you're new to the specialized field of metrological weights, it's helpful to know that the selection process can be broken into four simple steps:

1. Determine the regulatory standard that applies to your application.
  - a. International standard OIML R 111
  - b. U.S. standard ASTM E 617
  - c. U.S. Legal for Trade applications NIST Handbook 105-1
2. Find the accuracy class appropriate for your application by reviewing the accuracy and tolerance information, as well as your internal ISO documentation and any applicable manufacturer's instructions.
3. Select the laboratory documentation you require.
4. For Legal for Trade certification, Rice Lake Weighing Systems' metrology lab is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). For information on the certification process of NVLAP-accredited labs go to: [www.ricelake.com/aboutcalibration](http://www.ricelake.com/aboutcalibration).



## Calibration Certificates

Rice Lake offers several different calibration certificates:

1. Calibration Certification for weight classes ASTM class 0-3, OIML class E1, E2, F1 and F2 meets ISO/IEC 17025 certification and traceability.
2. Traceable Calibration Certificate meets requirements of ISO/IEC 17025 and traceability for ASTM 4-7, NIST class F, OIML class M1 and M2.
3. Rice Lake's Mass Value Certificate is not an accredited certificate. As found/as left data with environmental conditions are reported and meets traceability requirements (available for ASTM class 1-3, OIML class F1 and F2). Serial numbers are included in the cost of all certificates with the exception of the Certificate of Accuracy. Certificates are included in the box with the weights or mailed separately (for smaller weights). Replacement documentation is \$50 plus shipping.

## Traceable Certificate vs. Calibration Certificate

The major difference between the two is the method in which the weights are compared to the known standard. They both give the actual values and uncertainties. The Calibration Certificate will give a smaller uncertainty and a more precise value of the actual mass due to the multiple measurements that are made during the calibration process.

Both the Traceable Certificate and Calibration Certificate will include:

- Actual mass values or the corrections to the nominal mass of the weight being calibrated vs. 8 grams/cm<sup>3</sup>.
- The uncertainty of the measurement process as it relates to the item being calibrated.
- The environmental conditions present during the test.
- The assumed density of the weight being tested for atmospheric buoyancy corrections.

Which Document Do I Need? Please go to [www.ricelake.com/certification](http://www.ricelake.com/certification) for more information.

With such quick  
turnaround one might  
expect less service.

Not so!

Delivery ahead of request!  
I can't thank you enough.

WE PASSED  
OUR AUDIT WITH  
FLYING COLORS,  
THANKS TO YOU.

## Read Our Fan Mail

It almost makes us blush.

One customer wrote, "You guys are on top of it!"

Another declared,  
"We passed our audit with flying colors, thanks to you."

Yet another penned, "With such quick turnaround,  
one might expect less service. Not so!"

Another writes, "Delivery ahead of request!  
I can't thank you enough."

Yes, your "thank you" is enough. You make our day.

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