



OHIO METROLOGY LABORATORY SUBMISSION POLICY

June 26, 2020

The State of Ohio Weights and Measures Metrology Laboratory provides calibration services for the field standards used by both local inspectors/officials and private industry customers. The following document outlines the logistics of submitting items to the laboratory for calibration as well as the expectations for the customer.

The Ohio Metrology Laboratory adopts all requirements of the NIST Handbook 105 series for commercially used standards. Owners of commercially used standards should familiarize themselves with these publications in order to be aware of any requirements not covered in detail in this policy. The NIST 105 series of standards can be found at <http://www.nist.gov/pml/wmd/pubs/handbooks.cfm>

1. **Ohio Public Records Law.** Pursuant to ORC 149, all records kept by the metrology laboratory are considered to be public records and may be subject to public records request. However, in conjunction with the National Conference on Weights & Measures Policy Manual, Policy 5.1.1., the Ohio Metrology Laboratory will safeguard the confidentiality and proprietary rights of all NTEP applicants. NTEP certificate holders will be notified before any of their information is disclosed as part of a public records request so that they will have the opportunity to assert any legal right they may have under state or federal law to preclude that disclosure.
2. **Scheduling Work** Before sending any work to the Ohio Metrology Laboratory, you must first contact the lab to schedule the work and receive a calibration date. All items are expected to arrive at the lab on the business day prior to the scheduled calibration date. Include the following information with the artifacts:
 - Physical address to be listed on certificate
 - Billing address to which certificate and invoice will be mailed
 - Purchase Order
 - End user company name and address (If different than company submitting artifacts)
 - Description of artifacts including classification, when applicable

Contact the laboratory for scheduling. (614) 728-6290 or metrology@agri.ohio.gov

NOTE: Invoice(s) and Certificate(s) will be mailed or emailed to the billing address provided.

NOTE: Items delivered to the laboratory before being added to the schedule will be calibrated as soon as feasible and will incur an additional unscheduled work charge.

3. **Fees.** Please See Metrology Lab Fee Schedule for complete breakdown of lab fees, charges, and costs.
4. **Due Dates.** It is not the responsibility of the Ohio Metrology Laboratory to modify the schedule in order to accommodate artifacts that are near or past the calibration due date. It is the owner of the artifacts responsibility to make sure they are scheduled far enough in advance of the expiration date.



5. **Calibration Intervals.** Field standards used by Ohio Weights and Measures officials are required to be tested once every three years. Field standards used by registered servicepersons are required to be tested at least once every two years. These requirements are in accordance with Ohio Revised Code Section 1327.50 (H) and Rule 901:6-8-01.
6. **Shipping Items To Lab.** All items shall be securely packed before shipping. Any item ten (10) lb or larger should be shipped in wooden crates, not cardboard. The Ohio Metrology Laboratory is not responsible for items shipped improperly. Cardboard shipments are accepted for smaller items, but larger items should be double boxed and secured. Items should be individually wrapped or protected with appropriate packing materials. **Foam peanuts are not acceptable.**
NOTE: Handheld weight kits shall be secured in the closed position with latches, rubber bands, tape, boxes, or bags. Small weights can be lost if the kit is not securely closed.
NOTE: Weights 25 kg (50 lb) and larger, whether shipped or delivered, should be stacked on full size pallets whenever possible. A forklift is available for pallet delivery, but no loading dock is available.
NOTE: The laboratory **will not accept** items shipped freight collect or C.O.D.
7. **Return Shipping.** Return shipment of small boxes (150 lb or less) will be shipped via UPS Ground. Return shipment of large items (greater than 150 lb) will be shipped via UPS LTL Freight. Current UPS shipping and insurance charges will be prepaid by the Ohio Metrology Laboratory and added to the invoice along with the calibration charges and any applicable handling fees.
NOTE: It is the customer's responsibility to advise the laboratory of the appropriate monetary value for insurance amounts. This value should include the cost to replace the artifacts as well as the cost of recalibration. If an insurance value is not provided by the customer, the laboratory reserves the right to make a judgment on the value of which to insure the package. The Ohio Metrology Laboratory assumes no liability in excess of the insured amount.
NOTE: Arrangements for return shipping of items on pallets (LTL Freight) or shipments utilizing customer's shipping account (freight collect) should be made with the laboratory during scheduling or initial delivery.
8. **Disclaimer:** By scheduling services with ODA's Metrology Lab, you agree to hold ODA and its employees, agents, and representatives harmless, and waive all liability on ODA's part, for damage or loss of any materials or equipment located on ODA's Reynoldsburg campus. ODA shall not be liable for any damage or loss to materials or equipment resulting from being shipped to or from ODA. If materials or equipment are delivered by the owner of said materials or equipment, ODA shall not be responsible for the loading or unloading of such materials or equipment, and all loading or unloading shall be the responsibility of the owner of the materials or equipment. If ODA's employees, agents, or representatives assist with the loading or unloading of materials or equipment, said employees, agents, or representatives shall not be liable for any damage resulting from said loading or unloading activities.

CONDITION OF ARTIFACTS

National Institute of Standards and Technology (NIST) 105 Series Handbooks, ASTM E617 Standard, and policy outlined in this document are used by the Ohio Metrology Laboratory as suitability criteria for test equipment. Equipment must be submitted to the laboratory in good condition and ready for calibration.

All Items Submitted:



9. **Cleanliness.** Artifacts submitted must be cleaned of all foreign matter, such as but not limited to dirt, rust, concrete, adhering debris, loose paint, grease, oil, marks, films, bio-medical/chemical residue, or hydrocarbons. Foreign matter must be removed with water, mild detergent, mild solvent, or isopropyl alcohol before submission.
10. **Temperature of Artifacts.** The Ohio Metrology Laboratory requires that all artifacts' structural mass is at a temperature that will not affect the accuracy of the calibration process. Artifacts will be held in the laboratory's environment until this thermal equilibrium is obtained. Mass calibration procedures dictate the equilibration time for test weights based on the weight's nominal value, classification, and temperature when received. See Appendix A of this policy for minimum equilibration times for weights. Additional time may be required to address condensation.

Volume Standards:

11. **Cleanliness.** Test measures and provers must be cleaned of all foreign matter and rinsed out until there are no strong odors or evidence of hydrocarbons. Any vessels with obvious residues will be thoroughly cleaned by the Ohio Metrology Laboratory before being tested and additional charges will apply. Items that require extensive cleaning may be refused. Volume standards must also meet the cleanliness requirements found in paragraph 9 of this policy.
12. **Dents.** Dents must be removed and all leaks repaired.
13. **Corrosion.** Vessels with badly corroded interiors will not be tested.
14. **Painting.** All test measures not made of stainless steel must have a dried fresh coat of paint. This does not apply to items that have never been used.
15. **Condition.** Gauge tubes, valves, reading scales and other test measure and prover components must be in working order and in a reasonably good state of repair. No cracks can be present in gauge tubes.
16. **Non-Commercial Vessels.** Five gallon test measures called "non-reference" or "station standards" do not meet the requirements of NIST Handbook 105-3 and cannot be tested. These are generally identified with a glass plate set right in the neck of the test measure.
17. **Other NIST 105-X Requirements.** The Ohio Metrology Laboratory adopts all requirements of the NIST Handbook 105 series for commercially used standards. Owners of commercially used standards should familiarize themselves with these publications in order to be aware of any requirements not covered in detail in this policy. The NIST 105 series of standards can be found at <http://www.nist.gov/pml/wmd/pubs/handbooks.cfm>

Mass Standards:

18. **Painting.** Cast iron test weights must be cleaned and freshly painted with a **light** coat of paint, unless they are brand new, just prior to submission. Clean and paint all sides and bottom of each weight. A light coat of sprayed-on flat aluminum paint is recommended. Epoxy paint or plated surfaces are not acceptable. Cast iron metric and avoirdupois field standards shall be color coded (i.e., gold for metric and silver for avoirdupois) to differentiate the weights. The Ohio Metrology Laboratory reserves the right to refuse weights that have not been properly cleaned prior to painting. Paint applied over dirt, grease, or any other adhering debris is not acceptable. Contact the laboratory for questions regarding painting.



19. **Serial Numbers.** Individual weights not part of a handheld kit should be identified with a permanent stamp or serial number into the surface of the weight. Serial numbers shall not be placed on the bottom of the weight. *Identifying stickers are not allowed and will be removed from the surface of any weights submitted. Identification numbers or letters applied with paint or ink will not be accepted.* Handheld weight kits may have one serial number to cover all contents of the kit. In the case that multiple weights of the same nominal value are contained within the kit, each weight of the same nominal value should have a permanent, unique stamp or mark into the surface of the weight to differentiate from other weights of the same nominal value in the kit. The Ohio Metrology Laboratory may elect to stamp weights appropriately if not done so prior to submission. Serial numbers must be legible, this is especially important for cast iron weights that have been painted prior to submission.
20. **Cleanliness.** Interior of handheld weight kit cases should be wiped down or vacuumed to remove any foreign material. All weights shall meet the cleanliness requirements outlined in Paragraph 9 of this policy. A lint free cloth dampened with non-denatured ethyl alcohol works well for cleaning stainless steel weights. The Ohio Metrology Laboratory staff may elect to clean stainless steel weights at the owner's expense if a minimal amount of cleaning is needed. Items that require extensive cleaning may be refused.
21. **Same Day Calibrations.** The Ohio Metrology Laboratory may elect to perform same day calibrations of weights during seasons of the year that allow weights to be at an appropriate temperature at time of delivery. These tests must be scheduled in advance with the laboratory. Customers must be at the lab and ready to unload by 8:00 am on the scheduled calibration day. The minimum equilibration times found in Appendix A of this policy will be applied prior to beginning calibrations. Additional time may be required to address condensation.
22. **Fabricated Weights.** Fabricated weights (consisting of a steel case filled with various material) not previously submitted will not be accepted. Fabricated weights already certified are to be submitted at intervals not to exceed one year to ensure their stability. Fabricated weights that are unstable will be rejected and should be replaced with weights made of metal of uniform density, such as cast iron.
23. **Carrying Case.** Field standard weights up to and including 5 kg (10 lb) shall be carried in a rigid covered case designed to restrict movement and prevent damage to the weights. Separate pockets shall be lined with nonabrasive, noncorrosive material (e.g., soft, non-shredding plastic, wood). A separate box may be inserted into the larger box to house smaller denomination weights (e.g., 8 oz to 1/32 oz). This requirement also applies to Weight Carts' correction weight kits.
24. **Other NIST 105-X Requirements.** The Ohio Metrology Laboratory adopts all requirements of NIST Handbook 105 series for commercially used standards. Owners of commercially used standards should familiarize themselves with these publications in order to be aware of any requirements not covered in detail in this policy. The NIST 105 series of standards can be found at <http://www.nist.gov/pml/wmd/pubs/handbooks.cfm>

Field Standard Weight Carts:

25. **Fuel Level Error Weights (Correction Weights).** Correction weight kits shall accompany any weight cart submitted for calibration. These kits shall be comprised of enough 0.5 lb (8 oz) error weights (housed in a separate carrying case) to compensate for the fuel tank capacity visible on the tank's sight gauge.



26. **User Modifications.** User modifications of weight carts are discouraged. Any modifications must be permanent changes to the weight cart structure and will require recalibration prior to use. Any maintenance process performed between calibrations which alters the mass of the weight cart (e.g., changing the battery, wheels, hydraulic pump, etc) invalidates the previous calibration certificate and requires recalibration prior to use. **Removable clevises are not allowed. These must be permanently attached to the weight cart.**
27. **Finish / Cleanliness.** Weight carts must be kept clean at all times. Weight carts must be wire brushed and power washed prior to submission. A fresh coat of paint must be applied and dried (top to bottom) prior to submission. The nominal (empty weight) value must be clearly labeled on each side of the weight cart.
28. **Maintenance Log.** A maintenance log must be established and present with each weight cart. The maintenance log must contain a detailed record of all maintenance performed on the weight cart.
29. **Delivery to the Lab.** The Ohio Metrology Laboratory cannot unload weight carts from a customer's truck or trailer. It is the customer's responsibility to unload the weight cart to ground level at the time of delivery to the laboratory and load the weight cart back onto the truck or trailer after calibration.
30. **Other NIST 105-X Requirements.** The Ohio Metrology Laboratory adopts all requirements of NIST Handbook 105 series for commercially used standards. Owners of commercially used standards should familiarize themselves with these publications in order to be aware of any requirements not covered in detail in this policy. The NIST 105 series of standards can be found at <http://www.nist.gov/pml/wmd/pubs/handbooks.cfm>. Appendix A of this policy provides some general examples of retroactive and non-retroactive requirements for weight carts based on date of manufacturer.



Appendix A: Minimum** Laboratory Equilibration Time for Weights			
ΔT^*	Nominal Mass	OIML F1 ASTM 2 (time in hours)	OIML F2 to M3 ASTM 3 to 7 NIST F (time in hours)
$\pm 20\text{ }^\circ\text{C}$ ($\pm 36\text{ }^\circ\text{F}$)	1000 kg to 2500 kg (2000 lb to 5000 lb)	79	5
	100 kg to 500 kg (200 lb to 1000 lb)	33	4
	10 kg to 50 kg (20 lb to 100 lb)	12	3
	1 kg to 5 kg (2 lb to 10 lb)	6	2
	100 g to 500 g (0.2 lb to 1 lb)	3	1
	10 g to 50 g (0.02 lb to 0.1 lb)	1	1
	1 mg to 10 g (0.001 lb to 0.02 lb)	1	0.5
$\pm 5\text{ }^\circ\text{C}$ ($\pm 9\text{ }^\circ\text{F}$)	1000 kg to 2500 kg (2000 lb to 5000 lb)	4	1
	100 kg to 500 kg (200 lb to 1000 lb)	4	1
	10 kg to 50 kg (20 lb to 100 lb)	4	1
	1 kg to 5 kg (2 lb to 10 lb)	3	1
	100 g to 500 g (0.2 lb to 1 lb)	2	1
	1 mg to 100 g (0.001 lb to 0.2 lb)	1	1
$\pm 2\text{ }^\circ\text{C}$ ($\pm 4\text{ }^\circ\text{F}$)	1 mg to 2500 kg (0.001 lb to 5000 lb)	1	0.5
$\pm 0.5\text{ }^\circ\text{C}$ ($\pm 1\text{ }^\circ\text{F}$)	1 mg to 2500 kg (0.001 lb to 5000 lb)	0.5	0.5

* ΔT = Initial difference between weight temperature and laboratory temperature. Laboratory temperature maintained at 20 °C (68 °F).

**Additional equilibration time may be needed to address problems with condensation and frozen surfaces. Weights must be completely dry prior to calibration.

