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A-2, rev. 6 Local Standards used by authorized service providers

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Document(s): *Criteria for the Accreditation of Organizations to Perform Inspections Pursuant to the Electricity and Gas Inspection Act and the Weights and Measures Act (S-A-01); Weights and Measures Act and Regulations; Electricity and Gas Inspection Act and Regulations; Registration Program Terms and Conditions; Recognition of Calibration Results from CLAS Type I Laboratories Program (RC-01);*
Supersedes A-2-E, rev. 5

Subject: Local standards used by authorized service providers

1.0 Purpose

The purpose of this bulletin is to provide instructions for authorized service providers and organizations that have applied for accreditation or registration regarding the selection and preparation of standards for submission to Measurement Canada for calibration, certification and designation as local standards.

2.0 Scope

This bulletin applies to standards used by authorized service providers, as local standards, to inspect and certify, on behalf of Measurement Canada, weighing and measuring devices for which they are accredited or registered.

This bulletin does not apply to “measuring apparatus” mentioned in the *Electricity and Gas Inspection Regulations*.

3.0 Definitions

"Calibration": means a comparison between a test standard and a reference standard for the purpose of determining if the test standard's value is within the specified tolerances.
Note: the term "calibration" does not refer to the adjustment of a standard required to ensure it meets specified tolerances.

“Local standard”: means any standard designated by the Minister under section 13 of the *Weights and Measures Act*.

“Measuring apparatus”: means an apparatus, other than a local standard, that is required for measurement of electricity or gas or examination of meters.

4.0 Responsibilities of authorized service providers

Authorized service providers are responsible for:

4.1 Ensuring that their local standards are calibrated and certified at least at intervals prescribed under sections 56 and 57of the *Weights and Measures Regulations*.

4.2 Ensuring that standards submitted for certification by Measurement Canada are in good condition and properly cleaned and marked.

4.3 Ensuring that mass standards are adjusted, as outlined in this bulletin.

4.4 Ensuring that, for companies seeking accreditation or registration, standards are sent for calibration only when instructed by the Regional Manager-ASD or Regional Coordinator-ASD, or his/her delegate.

4.4.1 Under the Accreditation Program, standards should be sent when the quality management system documentation review is completed (or very close to being completed) by Measurement Canada.

4.4.2 Under the Registration Program, standards should be sent when at least one technician has successfully passed the theoretical training and the associated practical evaluation is very close to being completed.

4.5 Contacting Measurement Canada Calibration Services Laboratory or District Office, as appropriate, to make prior arrangements before sending standards for calibration and certification.

4.6 Ensuring that the number of standards submitted for certification by Measurement Canada is commensurate with the number of recognized technicians and the expected inspection workload to be performed on behalf of Measurement Canada. Only those standards used to perform inspection work on behalf of Measurement Canada will be certified and designated as local standards by Measurement Canada.

4.7 Ensuring that all standards sent to Measurement Canada Calibration Services Laboratory in Ottawa are accompanied by a correctly completed ASP - Request for Calibration Services - CSL form.

4.7.1 A standard sent for re-calibration with an expired certification, a broken seal, or in any condition affecting the certificate validity, require written justification of the incidence. This justification must accompany the Request for calibration services form.

4.8 Ensuring that all standards sent to Measurement Canada Calibration Services Laboratory in Ottawa are properly packaged to ensure adequate protection during shipping.

4.9 Providing standards to Measurement Canada, upon its request, prior to the end of the prescribed certification interval. Such requests would be for the purpose of verifying the condition of the standards, establishing their "as found" value, and determining whether an authorized service provider is maintaining its standards in satisfactory condition.

4.10 Assuming all packaging, shipping and handling costs and any brokerage fees for international shipments associated with the certification of the standards.

5.0 Accuracy requirement

Standards presented for certification and designation as local standards must meet the accuracy requirements set out in Schedule IV of the *Weights and Measures Regulations*.

6.0 Types of Standards (Calibration location)

6.1 Dimensional
- Gauge block (6)
- Tape measure (6)

6.2 Electrical
- Digital multifunction standard (1)

6.3 Gas
- Barometer (1)
- Bell prover (5)
- Dead weight tester - pneumatic (1)
- Pressure gauge (1)
- Pressure module (1)
- Pressure transducer (1)

6.4 Gravimetric
- Mass standards of 5 kg (10 lb) or larger (2) or (4) [see subsection 7.1.1]
- Mass standards of 5 kg (10 lb) and smaller (1) or (4) [see subsection 7.1.2]
- Mass standards of 20 kg and smaller used to inspect Class II devices (1) [see section 7.1]

6.5 Temperature
- Thermometer (1) see subsection 7.3

6.6 Volumetric
- Narrow neck 20 litre measure (1) [see subsection 7.2]
- Test measure and prover of 100 litres and less used to calibrate other provers or used to certify ASP's pipe provers (1) [see subsection 7.2]
- Test measure and prover used to inspect volumetric meters (2) [see subsection 7.2]
- Pipe prover (2) (see subsection 7.2)
- Hydrometer / LPG (1) and (3)
- Pycnometer (1)

Calibration location:

(1) Measurement Canada
Calibrations Services Laboratory
Standards Building
151 Tunney's Pasture Driveway,
Ottawa, Ontario, K1Y 4S1

(2) Measurement Canada District Office (various locations)

(3) National Research Council of Canada (NRC)
Ottawa

(4) CLAS Type I Laboratories (List of CLAS T ype I Laboratories) recognized by Measurement Canada

(5) On site calibration by Measurement Canada Calibrations Services Laboratory

(6) CLAS laboratory or laboratory recognized by the National Research Council of Canada providing traceability to the definition of the meter as per the *Weights & Measures Act*.

7.0 Specific Information on Standard Types

7.1 Gravimetric Standards

Mass Standards that meet International Organization of Legal Metrology (OIML) Class M1 requirements are suitable for the inspection of Class III, III HD and IIII weighing devices.

Mass Standards that meet OIML Class F2 requirements or better shall be used to perform inspections of Class II weighing devices.

Initial Inspections: [1]
- When performing initial inspections of Class II devices, mass standards meeting OIML Class F2 can only be used to verify Class II devices having no more than 31250 scale intervals and where 'e' is equal to or greater than 10 mg. Class II devices having more than 31250 scale intervals or where 'e' is smaller than 10 mg must be verified with mass standards of OIML Class F1 or better.

Subsequent inspections: [1]
- When verifying in-service tolerances, Class II devices having up to 62500 scale intervals and where 'e' is equal to or greater than 2 mg may be verified with OIML Class F2 mass standards. Class II devices having more than 62500 scale intervals or where 'e' is smaller than 2 mg, must be verified in-service with mass standards of OIML Class F1 or better.

Mass Standards meeting **OIML Class F1** can be used to inspect **all Class II devices**.

Please consult the local Measurement Canada Regional Gravimetric Specialist for advice on the selection of mass standards.

7.1.1 Mass Standards of 5 kg or larger (10 lb or larger) (Usually cast iron or fabricated weights) OIML Class M1

Mass standards of 5 kg or larger (10 lb or larger) must meet all requirements including requirements relating to construction, material and fabrication defined in OIML R111 and in RP-01 Field: Calibration Procedures for Standards of Mass, sections 2.4 to 2.4.8. It is recommended that organizations consult the local Measurement Canada Regional Gravimetric Specialist prior to the purchase or fabrication of any new weight design.

Before being submitted for calibration and certification, mass standards must be cleaned and prepared in accordance with the procedure described in the manual "RP-01 Field: Calibration Procedures for Standards of Mass". Mass standards which deviate from the nominal value (error) **by more than two-thirds of the prescribed tolerance** will have to be adjusted as close as possible to the nominal value. Authorized service providers must provide the necessary personnel to assist in making these adjustments. The purpose of adjusting the mass standard as close as possible to the nominal value is to ensure that, during the certification period, the error of mass standards does not exceed the tolerance prescribed in the *Weights and Measures Regulations*.

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[1] This section is under review. Until further notice, OIML Class F2 mass standards are suitable for inspection of all Class II devices.

7.1.2 Mass Standards of 5 kg (10 lb) and smaller (Usually stainless steel)
(Inspector's weight kits and individual weights) - OIML Class M1

Mass standards must meet all Measurement Canada requirements. Weights of 5 kg (10 lb) and smaller, that are part of an inspector weight kit or individual weights, shall be made of stainless steel or other material sufficiently resistant to corrosion and oxidation. Material and fabrication requirements for these weights are defined in OIML R111 and in RP-01 Field: Calibration Procedures for Standards of Mass, section 2.4. All weights belonging to an inspector's weight kit shall be submitted for calibration at the same time. Prior to the selection of materials other than stainless steel or for any other questions or concerns relating to mass standards of 5 kg (10 lb) and smaller, it is strongly recommended that organizations consult the Calibration Services Laboratory of Measurement Canada.

The Calibration Services Laboratory issues certificates for mass standards which do not deviate from the nominal value (error) **by more than one-half the tolerance** prescribed in Schedule IV to the *Weights and Measures Regulations*. Mass standards with an error exceeding one-half the prescribed tolerance will have to be adjusted as close as possible to the nominal value prior to certification. The purpose of this provision is to ensure that, during the certification period, the error of mass standards does not exceed the tolerance prescribed in the *Weights and Measures Regulations*. Adjustments of standards are the responsibility of the authorized service provider (weight owner).

The Measurement Canada Calibrations Services Laboratory does not provide weight cleaning, stamping or adjustment services. Inspector weight kits or individual weights that are not properly cleaned as per the recommended Cleaning Procedure for Inspectors Weight Kits, stamped or adjusted within the tolerance prescribed in Schedule IV to the *Weights and Measures Regulations* will be returned to their owner without being certified.

All weights shall be kept in a case comprising of appropriate compartments for each individual weight of a series. This is applicable to set of weights (commonly called inspector's weight kits) as well as to individual weights. The interior of the case shall be such that the weight is protected against any wear, abrasion or shock that may be encountered during transportation. All weights from a weight set must be kept in the same primary case.

In order to link inspector weight kit and individual weights to Measurement Canada calibration certificates or verification documents, all inspector weight kit and individual weights shall be identified, by the applicant if not already done by the manufacturer, by a unique serial number that consists of numbers, letters and / or symbols. All cases belonging to the same weight set and individual weights must display the same serial number.

7.1.3 Mass Standards of 20 kg and smaller used to inspect Class II devices (Stainless Steel/ Aluminium)
(High precision weight sets) - OIML Class F2 or better

Mass Standards of 20 kg and smaller used to inspect Class II devices shall **only be used for the inspection of legal for trade Class II devices**; otherwise the integrity of the weights may be compromised and the weights may be out of tolerance before the end of their calibration cycle.

All weights in a set shall be kept in a case comprising of appropriate compartments for each individual weight. The interior of the case shall be such that the weight is protected against any wear, abrasion or shock that may be encountered during transportation. All weights from a weight set must be kept in the same primary case. When stored, the carrying cases should be kept protected from dampness which can affect the stability of the standards.

Mass standards must meet all Measurement Canada requirements. High precision weights shall be made of stainless steel or other material sufficiently resistant to corrosion and oxidation.

Material and fabrication requirements for these weights are defined in OIML R111 and in RP-01 Field: Calibration Procedures for Standards of Mass, section 2.4. Prior to the selection of materials other than stainless steel or for any other questions or concerns relating to mass standards for inspecting Class II devices, it is strongly recommended that organizations consult the Calibration Services Laboratory of Measurement Canada.

The Calibration Services Laboratory issues certificates for mass standards which do not deviate from the nominal value (error) **by more than one-half the tolerance** prescribed in Schedule IV to the *Weights and Measures Regulations*. Mass standards with an error exceeding one-half the prescribed tolerance will have to be adjusted as close as possible to the nominal value prior to certification. The purpose of this provision is to ensure that, during the certification period, the error of mass standards does not exceed the tolerance prescribed in the *Weights and Measures Regulations*. Adjustments of standards are the responsibility of the authorized service provider (weight owner).

The Measurement Canada Calibrations Services Laboratory does not provide weight cleaning, stamping or adjustment services. High precision weight sets should not be cleaned other than by lightly dusting them with a lint-free cloth. They must never be cleaned by rubbing, polishing or using compressed air. High precision weight sets that are not properly cleaned, stamped or adjusted within the tolerance prescribed in Schedule IV to the *Weights and Measures Regulations* will be returned to their owner without being certified.

In order to link high precision weight sets to Measurement Canada calibration certificates or verification documents, all high precision weight sets shall be identified, by the applicant if not already done by the manufacturer, by a unique serial number that consists of numbers, letters and/or symbols. All cases belonging to the same high precision weight set must display the same serial number.

7.1.4 Recognition of Calibration Results from CLAS Type I Laboratories Program (RC-01)

Mass Standards of 20 kg and smaller used to inspect Class II devices (high precision weight sets) are weights calibrated to within the tolerances specified for local standards used to inspect devices for weighing precious metals (Schedule IV, Part I and Part II of *the Weights and Measures Regulations*), which are not presently open to the Recognition of Calibration Results from CLAS Type I Laboratories Program (RC-01). All high precision weight sets used for the inspection of legal for trade Class II devices shall be sent to Measurement Canada for calibration and designation as local standard.

Mass Standards that meet International Organization of Legal Metrology (OIML) Class M1 requirements, suitable for the inspection of Class III, III HD and IIII weighing devices, that were never designated as local standards must be submitted to Measurement Canada for the initial evaluation and the designation as local standards unless they have been initially evaluated and accepted for use by Measurement Canada. Only subsequent evaluation can be performed by a recognized CLAS type 1 laboratory under the *RC-01 program*.

Authorized service providers utilizing the RC-01 program for the calibration of their weights and weight sets must meet the requirements of paragraphs 4.1, 4.6 and 4.9. Requirements of paragraph 4.6 is applicable to weights and weight sets certified and designated as local standards and not to other weights and weight sets the authorized service providers may need to have calibrated. Requirements of paragraph 7.1.1 and 7.1.2 must also be met; cleaning, stamping and adjustment may be provided by the CLAS Type I laboratory.

All weights and weight sets sent to a CLAS Type I laboratory must be properly packaged to ensure adequate protection during shipping. They must also be accompanied by an application form *ASP - Request for Calibration Services - CSL form* correctly completed and the last certificate of calibration issued by Measurement Canada.

7.2 Volumetric Standards

Volumetric standards must meet all requirements including requirements relating to construction set out in the Measurement Canada manual Calibration and Certification Procedures for Volumetric Standards. It is recommended that organizations consult the local Measurement Canada Regional Volumetric Specialist prior to the purchase or fabrication of any new standards design and equipment not included in the Calibration and Certification Procedures for Volumetric Standards manual.

Before being submitted for calibration and certification, volumetric standards must be cleaned. Walls must be free of greasy or oily residue, dirt or rust. The coating on the inside surface must be in good condition with no obvious peeling. The standards must be free of flammable or noxious vapours.

The Calibrations Services Laboratory and the District Offices of Measurement Canada do not provide cleaning of volumetric standards. Volumetric standards that are not meeting construction requirements or are not properly cleaned will be returned to their owner without being certified.

7.3 Temperature standards

Temperature standards must meet the accuracy requirements set out in Schedule IV to the *Weights and Measures Regulations*. It is recommended that organizations consult the local Measurement Canada Regional Volumetric or Gas Specialist prior to the purchase of temperature standards.
For the specified application, thermometers shall have a minimum resolution and range as follow :

Application	Minimum Range	Minimum Resolution
General field inspection	-30˚C to +50˚C	0.1˚C
Calibration of thermometer used in gas prover for temperature correction	0˚C to +35˚C	0.01˚C
Temperature correction in gas measuring apparatus	0˚C to +35˚C	0.1˚C
Bell prover air temperature(s)	0˚C to +35˚C	0.1˚C

Thermometers intended for field use shall be stored in a hard protective carrying case with foam inserts, cut to the probe profile or similar means to protect them. The carrying case must have sufficient padding to prevent breakage of the thermometer and the probes.

Thermometers shall have the following information permanently marked on or be capable of being displayed: manufacturer's name, model number and serial number. In the case of thermometers with multiple probes, each probe must be marked by a unique identifier.

Where the instrument is capable of being calibrated or adjusted, the access to the adjustments shall be easily detectable or sealable.

8.0 Revisions

Effective date of the initial version of this bulletin: 2004-01-28 .

8.1 The purpose of revision 1 (2004-05-03) was to:

- remove the note on page 1 regarding the availability of the "Calibration Procedures for Standards of Mass" manual; this manual is now available on line;

- clarify section 3 regarding requirements for weights equal to or less than 5 kg /10 lb contained in a weight kit;
- remove the reference to the Engineering Division as direct contact;
- inform on the number of standards acceptable for calibration;
- correct editorial errors.

8.2 The purpose of revision 2 (2006-02-03) was to:

- clarify the responsibilities of authorized service providers as it pertains to the certification of mass standards;
- clarify which services are provided by the Measurement Canada Calibration Services Laboratory.

8.3 The purpose of revision 3 (2006-11-17) was to:

- change S-A-01:2002 references to S-A-01;
- indicate the new street address for the Calibration Services Laboratory.

8.4 The purpose of revision 4 (2008-01-07) was to:

- expand the scope to include all local standards used by authorized service providers;
- indicate the calibration location;
- include the “Recognition of Calibration Results from CLAS Type I Laboratories Program” (RC-01).

8.5 The purpose of revision 5 was to:

- ask a justification when a standard is sent for re-calibration to Measurement Canada Calibration Services Laboratory in Ottawa with an expired certification, a broken seal, or in any condition affecting the certificate validity;
- clarify which weights and weights set can be calibrated by a recognized CLAS type 1 laboratory under the RC-01 program.

8.6 The purpose of revision 6 is to:

- update section 4.4 on when standards should be sent to MC for calibration based on the new MC structure;

- make reference to OIML R111 documentation for construction of standards;

- add the requirements for Mass standards of 20 kg and smaller used to inspect Class II devices following the opening of Class II devices to the Accreditation Program.

9.0 Additional Information

For additional information regarding this bulletin, please contact Mr. Michel Maranda, Program Officer - Innovative Services Directorate. The copy of this document located on the Measurement Canada web site is considered to be the controlled copy.

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Measurement Canada