VIETNAM INSTITUTE OF ACCREDITATION			

SUPPLEMENTARY REQUIRMENTS FOR ACCREDITATION OF CALIBRATION LABORATORY
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AMENDMENT STATUS

Amend. No	Date	Amendment content and related clause	Approved by
1	10/05/2019	Initial Release	
2	18/04/2021	- Editng the content of the process, issued for the 2nd time.	

1. Purpose

This document specifies the supplementary requirements of VACI for clarifying and/or specifying general requirements for the competence of testing and calibration laboratories following TCVN ISO / IEC 17025 and relevant legislation documents to calibration laboratories, ensuring that laboratory assessments and accreditation are accurate, reliable, and objective.

2. Scope of application

- Calibration laboratories are an applicant for accreditation following the standard TCVN ISO / IEC 17025

- VACI's assessors (auditors)

3. Supplementary requirements

3.1 Structural requirements (article 5)

(1) In case the Lab. provides calibration service, it shall get a registration certificate of calibration service granted by the competent authority(supplement to 5.1).

Note:

- Verification, calibration, and testing of measuring instruments and measurement standards must be registered according to Decree No 105/2016/NĐ-CP

- Conformity assessment (verification, testing, certification, inspection) must be registered according to Decree No 107/2016/ND- ND-CP)

(2) In case the lab is a defined part of a legal entity, it must clear indicate the position of the lab in the organization's structure and have a document specifying the functions and duties of the laboratory in the activities of the organization and specifying authority to sign and approve documents of the laboratory management system and report results. (supplement to 5.5)

3.2 Resource requirements (article 6)

3.2.1 Personnel (clause 6.2)

(1) Personnel assigned the authority to sign and approve results must have a bachelor's degree in engineering and at least 02 years of experience working in the calibration field under their authority to sign. If the university diploma is not a technical major, it must have worked in the calibration field under the authority to sign for at least 3 years. (supplement to 6.2.2)

(2) Personnel performing calibration of potentially unsafe equipment or at a site with safety regulations must have evidence of relevant safety training. (supplement to 6.2.2)

(3) Calibration technicians must have evidence of training in the calibration metho, and have sufficient qualifications and skills for performing the calibrations assigned to them. Newly trained calibration technicians must be monitored and supervised for their competence and skills to perform calibration for at least 3 months (supplement to 6.2.3).

The laboratory must keep a record of the training, assessment and monitoring and supervision of the competence of calibration technicians.

3.2.2 Facilities and environmental conditions (clause 6.3)

(1) For calibration of potentially unsafe objects or there are safety regulations, the laboratory must have evidence of meeting and following the regulations of the competent authority and the equipment manufacturer. (supplement to 6.3.2)

(2) When performing calibration outside of a permanent site, the laboratory should have personnel responsible for controlling facilities and environmental conditions for calibration and handling technical problems that arise during calibration. (supplement to 6.3.3)

3.2.3 Equipment (clause 6.4)

(1) To ensure that the calibration equipments give accurate results (according to 6.4.5), depending on the function and the significant of influence of the equipment on the reported results, the laboratory chooses one of the measures of metrological controls following (self-performing or outsourcing):

- *Calibration: providing the precise value or correction value at the certain value (s) for use within a certain duration;*

- *Verification: confirming the compliance of an equipment with technical and metrological requirements in the hole it's measurement range and allowed to use in a certain duration;*

- *Check: validation of one or more technical or metrological specifications of the equipment or determination of correct value, or correction value at predetermined value (s) prior to use in specific test.*

(2) Equipment that directly influences the calibration result, i.e. the result of the measurement with this equipment being a data component for establishing the result report, shall be subject to mandatory calibration. (supplement to 6.4.6)

(3) To ensure that the equipment works correctly and give reliable results, the laboratory must establish and manage a program for periodical calibration, verification and checking of equipments (4.6.7) based on:

- Structure characteristics, operating principles;

- Conditions of storage, use, maintenance and mid-term checking results.

Priority to select calibration and verification interval in the following cases:

- The calibration and verification interval of similar equipment has been specified in the documents and technical guidances issued by the state competent authority.

- Apply the maximum calibration and inspection interval as instructed in the Appendix attached to this document.

3.2.4 Metrological traceability (clause 6.5)

(1) The lab shall establish a metrological traceability diagram (verification and calibration chart) to show that their measurement results can be related to national or international standards. At each level of the chain, the appropriate linkage ability (in terms of measuring range, measurement uncertainty) must be shown. (supplement to 6.5.1)

(2) Calibration of equipment in the metrological traceability chain must be

performed by a calibration organization in accordance with the Regulation on metrological traceability of measurement results VACI.R.7.1.03.

3.2.5 Externally provided products and services (clause 6.6)

(1) If the laboratory uses the results of an external laboratory for the calibrations registered for accreditation, they must use services of the laboratory accredited by the VACI or another accreditation bodies that participate the ilac-MRA and the accreditation decision are still valid (6.6.2). Results performed by an external laboratory should be clearly identified in the laboratory's calibration report

3.3 Process requirements (article 7)

3.3.1 Selection, verification and validation of methods (clause 7.2)

(1) Laboratories applying calibration methods, according to national and international standards, and widely accepted by Scientific Associations in the world such as TCVN, ISO, OIML, EUROMET, IEC ... must have records of valuation of basic conditions - resources required by calibration methods and evidence of obtaining a calibration result of the same precision as the required by method and/or in accordance with the specific requirements for the calibration object. (supplement to 7.2.1)

(2) In case a laboratory applies a non-standard method, a modified standard method, and an method deverloped by the laboratory itself (internal method), the laboratory must to validate the method as follows:

- For modified standard method: validate the modified content;

- For the non-standard method and the internal method: validate the whole method.

Note: for deverlopment of internal calibration methods, the lab can refer to the structure, content and requirements of the Vietnam Technical Metrological Document (ĐLVN) on the calibration or verification procedures;

3.3.2 Technical records (clause 7.5)

(1) Technical records are all documents, information and data during calibration process (7.5.1, 7.5.2), including:

- Records of handling of calibration items;

- Calibration method;

- Data on control of environmental conditions

- Calibration equipment used;

- Original monitoring data, calculation of results, including signs and data to be able to identify and refer to the calibration conditions;

- Calibration personel, results reviewer;

- Report the results and interpretations, if any;

- Other detail information specified in calibration method, contract or legal regulations, if any.

Note: In case the laboratory deverlopes by themselves software, spreadsheet to process data and calculate calibration results, measurement uncertainty, it must validate these

software, spreadsheet and take appropriate controls to prevent unauthorized access and alteration of software or spreadsheets.

3.3.4 Evaluation of measurement uncertainty (clause 7.6)

(1) The laboratory shall perform the calculation and declare the measurement uncertainty for each calibration according to the calibration method. In case the calibration method does not provide instructions on how to calculate the measurement uncertainty, the laboratory must develop a guidance for evaluation ot the uncertainty of calibrations on the basis of national standards:

- TCVN 9595-1: 2013 (ISO / IEC Guide 98-1: 2009), Part 1: Introduction to the presentation of measurement uncertainty, and

- TCVN 9595-3: 2013 (ISO / IEC Guide 98-3: 2008), Part 3: Guidance on the presentation of measurement uncertainty (GUM: 1995).

3.3.5 Ensuring the validity of results (clause 7.7)

(1) The laboratory must establish and conduct a plan for monitoring the validity of results (supplement to 7.7.1). The plan should show:

- the calibrations of each field within the accreditation scope;
- Measures to be applied within the capacity of the laboratory;
- Criteria for acceptance of the results; and
- With a frequency not less than 2 times/year

Note: the key calibration test is the calibration of objects with higher metrological performance in the respective field of measurement.

(2) The laboratory must participate in proficiency testing programs in accordance with the Regulations on Participation in Proficiency Testing Activities VACI.R.7.1.02 (supplement to 7.7.2).

3.3.6 Reporting of results (clause 7.8)

(1) If the Report on the result includes the results of the unaccreditation calibrations, the laboratory shall have a note or mark to distinguish the accreditation and unaccreditation calibrations (supplement to 7.8.1.2).

(2) If the Report on the result includes the results of other accredited subcontractors, the subcontractor result report must be issued to the customer with all contents except the case only. part of the result is done by the subcontractor.

Note: In the accredited subcontractor Report of results, information and / or the logo of the accreditation body must be shown and accepted by the customer in the accreditation contract agreement.

4. Management system requirements (article 8)

4.1 Control of records (clause 8.4)

(1) Record retention period should not be less than 5 years unless there is a contractual agreement or a legal requirement. (supplement to 8.4.1).

4.2 Internal audits (clause 8.8)

(1) Laboratories must plan and perform an internal audit of the entire management system at least every 12 months. (supplement to 8.8.1).

4.3 Management reviews (clause 8.9)

(1) Laboratories must carry out the management review at the appropriate time at least once a year. (supplement to 8.9.1)

APPENDIX
INSTRUCTIONS FOR INTERVAL OF CALIBRATION AND CHECKING OF EQUIPMENT

1. General

- This annex provides detailed guidance on mid-term calibration and checking interval for equipment used in calibration laboratories.

- Calibration: a set of operations under specified conditions to establish the relationship between the quantities displayed by a measuring devices, measuring systems and values represented by an measurement standards or reference materials.

- Check: a measurement at at least one point within the measuring range of a measuring equipment, system against a known value to determine that there is no major deviation from the values of initial calibration. The test can be performed using an artifact to determine that the instrument still guarantees the accuracy required.

- Calibration and check intervals in Table 1 are the maximum for each equipment is based on:

    + Equipment of good quality, stable performance, installed in a suitable location and used reasonably;

    + Staff is knowledgeable and proficient to perform internal tests of equipments;

    + Checking activities to confirm only the good functioning of the equipments.

- Laboratories must shorten calibration and / or checking interval when the equipment operates in less ideal conditions. If there is any suspicion of equipment failure, the laboratory should perform recalibration immediately and then reduce the interval until it is found to be stable.

- Reducing calibration and / or checking intervals may also be required in specific test applications or with specific equipment configurations.

- The laboratory can extend the calibration intervals based on parameters such as monitoring calibration data, check to ensure stability of equipments, frequency of use, accuracy required or laboratories with staff. qualified to conduct internal testing or participate in proficiency testing programs with a good result.

- The calibration and check must ensure the metrological traceability of the results. In case the laboratory performs the calibration and check by itself, it must keep the calibration and check records.

2. Calibration, test intervals for common testing equipments

Calibration, check intervals, the content and test method are refered to Table 1.

Table 1. CALIBRATION AND CHECKING INTERVAL

Equipment	Calibration interval (year)	Check interval (month)	Procedure and recommendation
BALANCES	3	12 6 1 When using	Service repeatability check one point check zero point check.
WEIGHTs			
Reference - of integral stainless steel or nickel chromium alloy	3 then 6		
Working standard - stainless steel or nickel chromium alloy	3		
Working standard - other alloy	1		
PRESSURE			
BAROMETER			
Fortin	Initial then	60	One point check with transfer instrument.
Aneroid	1		
MANOMETERS			
Reference - liquid	10	36	Check the cleanliness of the fluid
Working standard - liquid	3	36	Check the cleanliness of the fluid
Electronic	1		
PRESSURE EQUIPMENT			
Test gauges used for calibration of industrial gauges	1		
Industrial gauges not subject to shock loading	1		
Industrial gauges subject to shock loading	6 months		
Pressure transducers	1		

Calibrators	1		
Pítson gauge			
Piston gauge, accuracy<0.01%	2	12	Spin speed, ĐLVN 64
Piston gauge, accuracy<0.01%	2	12	
ELECTRICAL INSTRUMENT			
Digital multimeters	1	6	Compare with meters of similar resolution
Analog meters	2	6	Compare with meters of similar resolution
THERMOMETERS			
Reference – liquidin-glass	10	before use	Check at ice point, ĐLVN 137
Woking standard – liquid-in-glass	10	6	Check at ice point or at one point in the working range against a reference thermometer. ĐLVN 137
Working - resistance	5	6	Check at ice point, ĐLVN 135
Woking – digital display RTDs	1	6	Check at ice point or at one point in the working range against a reference thermometer. ĐLVN 138
FORCE TESTING MACHENES			
Dead weight	5		
Elastic dynamometer	2		
Hydraulic, pneumatic	2		
LENGTH			
Reference – angle gauge	4 then 8 subsequent		
Working – angle gauge	2 then 4 subsequent		
Reference gauge block.	4 then 8 subsequent		
Working length bar	2 then 4 subsequent		
Reference length bar	4 then 8 subsequent		
Working length bar	2 then 4 subsequent		
Levels (precision) mechanical	4		

Levels (precision) electronic	4	12	Check single point
linear scales (precision)	5 then 10 subsequen		
Measuring machines (other than CMM's)			
- precision scales	10		
- geometric tets	5		
- micrometer heads	3		
- micrometer	5	5	zero, one point (against gauge block) and condition of anvils
Flat glass	3 then 6 subsequent		
Parallel flat glass	3 then 6 subsequent		
Precision polygons	5 then 10 subsequent		
Other electromic	1		
Rollers and balls	4 then 8 subsequent		
Roundness standards	5 then 10 subsequent		
Roughness standard - metal	4	12	Microscopic ínpection
Roughness standard - glass	Initial	12	Microscopic ínpection
Screw pitch reference standards	3 then 6 subsequent		
Screw thread measurement cylinders and vee pieces	initial	12	Vísual inspection
Setting cylinders	3 then 6 subsequent		
Setting ring	3 then 6 subsequent		
Sine bars, centres and tables	3 then 6 subsequent		

Squareness testers	3 then 5 subsequent		
Squares			
- Try squares	2 then 5 subsequent		
Block squares	4 then 8 subsequent		
Straightedges stell/ cast iron	3 then 6 subsequent		
- Granite stone	4 then 8 subsequent		
Surface plates			
- Cast iron	3 then 6 subsequent		
Tape measures	Initial	2 to 5	Check at maximum length, depending on use and accuracy required.
Steel rules	Initial		
Torque			
- Standards – beam and masses	4 then 8 subsequent		
- Transducer	1	12	In house cross check of overlapping range.
Time - frequency			
Oscilloscope)	1		
Funtional wave generator	1		
Frequency generator calibrator (GPS)	1		
Frequency electronic acounter	1		ĐLVN 51
Time measuring íntrusment			
- Stopwatch	1	6	
Volumetric glassware			
- Pipettes, burettes, flasks, distillation receivers	Initial		
Piston-operated volumetric apparatus	Initial		Check the volume delivered at the setting in use.