

The following pages present *R205 – Specific Requirements: Calibration Laboratory Accreditation Program* (dated December 8, 2011), *P109 – Technical Consensus Decisions from the Measurement Advisory Committee (MAC)*, dated May 5, 2011 and *P110 – A2LA Policy on Measurement Uncertainty in Calibration*, dated May 5, 2011. **All laboratories seeking accreditation in the Calibration field must meet these specific requirements, in addition to the general requirements contained in ISO/IEC 17025: 2005.**

ANSI/NCSL Z540-1-1994: This checklist also includes the requirements in ANSI/NCSL Z540-1-1994 that are not covered by ISO/IEC 17025 or R205. Laboratories seeking accreditation to ANSI/NCSL Z540-1 must meet these additional requirements. Accreditation to ANSI/NCSL Z540-1 is **optional**.

ANSI/NCSL Z540.3-2006: Additional requirements specifically applicable to laboratories seeking an optional accreditation for ANSI/NCSL Z540.3-2006 are contained in a separate checklist: *C207a – Annex to Specific Checklist: ANSI/NCSLI Z540.3-2006*.

Field Calibration: Additional accreditation requirements specifically applicable to laboratories performing calibrations at customer sites are contained in a separate checklist, *C103 – General Checklist: Accreditation of Field Testing and Field Calibration Laboratories*.

CAB Name:			
Address:			
Contact:			
Phone:		Email:	
Master Code:		Assessment ID:	
Certificate(s):		Conformity Standard:	
Assessment Dates:		Assessment Type:	
Assessor(s):		Assessor Signature(s):	
AcO:			

Assessors: By signing I certify to the best of my knowledge, all laboratory document references below as well as actual laboratory practices have been assessed for compliance with the relevant clauses of *R205 – Specific Requirements: Calibration Laboratory Accreditation Program*; *P109 - Technical Consensus Decisions from the Measurement Advisory Committee (MAC)*; *P110 - A2LA Policy on Measurement Uncertainty in Calibration* and of ANSI/NCSL Z540-1-1994 (if applicable). Any areas of noncompliance have been fully described in the Assessor Deficiency Report.

*A2LA Assessor Instructions: Review the laboratory’s documented quality system to verify compliance with the applicable documentation requirements. Assess to verify that the documented quality system is indeed implemented as described. Place a tick mark in the yes (Y), no (N) or not applicable (NA) space for each requirement. **Please note that for all N/A indications, you must document the reason why this requirement is N/A in the comments section.** Record comments related to any requirement on the space provided. Assess the laboratory’s technical competence to perform specific calibrations or specific types of calibrations. Record comments related to calibrations on A312 – Method Matrix: ISO/IEC 17025. All deficiencies must be identified and explained in the assessor deficiency report.*

C207 – Specific Checklist: Calibration Laboratory Accreditation Program					
Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
		Compliance			
		Y	N	NA	
2.0	Specific Requirements				
2.1.1	Calibration intervals for each measuring instrument or standard shall be established to control the probability of calibrations being out-of-tolerance at the end of the calibration interval. The method used to establish and adjust intervals shall be documented and based upon a determination of the standard’s performance.				
	Equipment records shall include the measured value for each parameter found to be out of tolerance during calibration or verification.				



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Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
		Compliance			
		Y	N	NA	
2.1.2 Where an intrinsic standard or system is used as a standard, the following requirements apply:					
a) direct intrinsic standard or system-to-intrinsic standard or system comparison with NIST or an accredited laboratory shall be conducted at appropriate intervals to ensure the correct realization of the measurand;					
b) documented calibration history of the device used to measure differences between intrinsic standard or system and unknown values shall be maintained;					
c) documented calibration history of the intrinsic standard or system components (e.g., the time base of the reference frequency counter in a Josephson voltage array system) shall be maintained;					
d) documented evidence of periodic checks on system precision and stability (e.g., leakage currents, ground loops, thermal emf's, step integrity, trapped magnetic flux, noise, and microwave power impinging on a Josephson voltage array) shall be maintained.					



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Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
		Compliance			
		Y	N	NA	
2.1.3 Accredited (endorsed) calibration certificates and reports (Note: Items in italics are taken directly from ILAC P14:11/2010 <i>ILAC Policy for Uncertainty in Calibration</i>)					
<p>a) <i>Accredited calibration laboratories shall report the uncertainty of measurement, in compliance with the requirements of this document.</i></p>					
<p>b) <i>The measurement result shall normally include the measured quantity value y and the associated expanded uncertainty U. In calibration certificates the measurement result should be reported as $y \pm U$ associated with the units of y and U. Tabular presentation of the measurement result may be used and the relative expanded uncertainty U / y may also be provided if appropriate. The coverage factor and the coverage probability shall be stated on the calibration certificate. To this an explanatory note shall be added, which may have the following content:</i></p> <p style="margin-left: 40px;"><i>“The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.”</i></p>					



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Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
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		Y	N	NA	
c) <i>For asymmetrical uncertainties other presentations than $y \pm U$ may be needed. This concerns also cases when uncertainty is determined by Monte Carlo simulations (propagation of distributions) or with logarithmic units.</i>					
d) <i>The numerical value of the expanded uncertainty shall be given to two significant figures and in the final statement the numerical value of the measurement uncertainty shall always be rounded up.</i>					
e) <i>Contributions to the uncertainty stated on the calibration certificate shall include relevant short-term contributions during calibration and contributions that can reasonably be attributed to the customer's device. Where applicable the uncertainty shall cover the same contributions to uncertainty that were included in evaluation of the CMC uncertainty component, except that uncertainty components evaluated for the best existing device shall be replaced with those of the customer's device. Therefore, reported uncertainties tend to be larger than the uncertainty covered by the CMC. Random contributions that cannot be known by the laboratory, such as transport uncertainties, should normally be excluded in the uncertainty statement. If, however, a laboratory anticipates that such contributions will have significant impact on the uncertainties attributed by the laboratory, the customer shall be notified according to the general clauses regarding tenders and reviews of contracts in ISO/IEC 17025.</i>					



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Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
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		Y	N	NA	
f) The uncertainty of reported measurements shall be stated as the actual uncertainty of the measurement, not as the accredited CMC unless that CMC actually applies.					
g) An indiscriminate use of the CMC listed on the A2LA scope of accreditation as the uncertainty of an actual calibration is not justified.					
h) <i>As the definition of CMC implies, accredited calibration laboratories shall not report a smaller uncertainty of measurement than the uncertainty of the CMC, as stated on a Calibration laboratory's Scope of Accreditation, for which the laboratory is accredited.</i>					
i) Laboratories are permitted to issue certificates with a statement of compliance (i.e., conformance to a specification) relating to the metrological aspects of specifications. In such cases the laboratory shall ensure that:					
1) the specification is a national or international standard or one that has been agreed to or defined by the customer;					
2) the measurements needed to determine conformance are within the accredited scope of the laboratory;					



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Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
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		Y	N	NA	
3) when parameters are certified to be within specified tolerance, the associated uncertainty of measurement is recorded and maintained for future reference.					
4) when parameters are certified to be within specified tolerance, the associated uncertainty of the measurement result is properly taken into account with respect to the tolerance by a documented procedure or policy implemented by the laboratory that defines the decision rules used by the laboratory for declaring in or out of tolerance conditions;					
5) the certificate relates only to metrological quantities and states which clauses of the specification are certified to have been met.					
2.1.4 Method or parameter observation during an assessment					
a) At a minimum, all of the parameters or all of the method(s) on the draft scope of accreditation must be observed by the assigned assessor during the assessment at least once in a four-year period.					
b) If a parameter or method is not observed by the assigned assessor within a four-year period, that method or parameter will be removed from the scope of accreditation until such a time as it can be observed.					

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c) If a laboratory can demonstrate successful participation in a commercially available proficiency test or a well organized inter-laboratory comparison that meets the requirements of 17043 <i>at the level of uncertainty being claimed on the draft scope of accreditation</i> the laboratory may rely on this demonstration in lieu of an observed parameter during the assessment.					
d) In cases where it is not possible to observe a parameter or method an exception request may be submitted to A2LA for consideration.					



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P109 - Technical Consensus Decisions from the Measurement Advisory Committee (MAC). Note: the date in parentheses is the date of implementation.

Requirement	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
	Compliance			
	Y	N	NA	
NOTE TO ASSESSORS: _____ Check here if none of the P109 technical consensus decisions applies and P109 section 1b to 7a will be considered as “N/A”				
1b. Decision rules do not need to be provided on a calibration certificate if the provider (OEM) states the measured value, the uncertainty, and that it is within specifications. (1/13/11)				
1c. It is never acceptable to accept manufacturer’s specifications in lieu of uncertainty budget calculations. (1/13/11)				
1d. The acceptability of a single point calibration is determined on a case-by-case basis by the technical assessor. (1/13/11)				
2a. For cases where a gage block is damaged it is agreed that there is no “before” data available and the “as found” information is stated on the certificate. An A2LA assessor would not expect to see before data on a certificate if the received condition says damaged or in need of repair/replacement. (1/13/11)				
3a. For Fluke Coils an open-ended calibration interval is acceptable as further calibrations would not be needed, only visual checks. (1/13/11)				
3b. A Conformance Assessment Body (CAB) is considered to meet section T9 of the A2LA Traceability Policy for Calibration of Fluke 50 turn coils in lieu of the calibration certificate for cases where the calibration certificate pre-dates the reverse traceability information provided from Fluke. The in-house calibration must be limited to the range from the initial original calibration certificate for the coil.				



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Requirement	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
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	Y	N	NA	
4a. The minimum factors required for hardness uncertainty budgets are repeatability, resolution, and the uncertainty of the block. Note: this is applicable for hardness uncertainty budgets documented prior to the implementation of <i>P110 – Policy on Measurement Uncertainty in Calibration</i> . (1/13/11)				
5a. The “Moody Method” for flatness using the "Union Jack" pattern is accepted as a standard method. (1/13/11)				
6a. That three approaches are deemed as acceptably meeting <i>P102 – A2LA Policy on Measurement Traceability for environmental chambers</i> (5/5/2011) are: <ol style="list-style-type: none"> 1. An in-house calibration performed in accordance with the manufacturer instructions/recommendations and (T9) of P102, as long as the CAB, when using the environmental chamber, includes an accredited sensor with the load to measure the environment during the test; or 2. The CAB obtains an accredited calibration of the entire system; or 3. The CAB obtains an accredited calibration of the individual components of the entire system. 				



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	Y	N	NA	
<p>7a. For accredited, endorsed, calibration certificates, it is agreed that as long as the CAB indicates in the contract with the client that the calibration results will be reported without factoring in the effect of uncertainty on the assessment of compliance, and the client agrees to the contract, then the uncertainty can be excluded when making that statement of compliance on the calibration certificate. In effect, both parties share the risk that the results may or may not meet the specification since the uncertainty was not included when the results were determined. (5/5/2011)</p> <p>Note 1: as of December 1, 2011, for accredited, endorsed, calibration certificates, the actual measurement uncertainty shall be included on the calibration certificate, regardless of whether or not a statement of compliance is made, in order for the certificate to be in compliance with <i>P102 – A2LA Policy on Measurement Traceability</i>.</p> <p>Note 2: A CAB cannot claim to meet a method in cases where the method requires the consideration of the uncertainty.</p>				



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P110 - A2LA Policy on Measurement Uncertainty in Calibration

Terms/Definitions :

Measurement Uncertainty refers to the measurement uncertainty calculation developed to demonstrate how the claimed Calibration and Measurement Capability (CMC) was derived for the scope of accreditation. It does not refer to the measurement uncertainty calculated as part of the measurement as reported on a calibration certificate.

Significant further means a contributor whose contribution increases the CMC by five percent (5%) or greater.

Standard Contributor refers to those items outlined in section 5.1.

Requirement	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
	Compliance			
	Y	N	NA	
<p>5.1 Measurement Uncertainty Contributors</p> <p>NOTE TO ASSESSORS: ____ Check here if all uncertainty records are documented before January 1, 2012 or all revisions to existing records are documented before January 1, 2012. In these cases, section 5.1 and 5.2 will be considered “NA” and section 5.3 applies.</p> <p>For those uncertainty records documented after implementation of this policy (January 1, 2012), including those revisions to existing records, a deficiency shall be written where objective evidence demonstrates that this policy has not been met:</p> <p>5.1.1 Every measurement uncertainty shall take into consideration the following standard contributors, even in cases where they are determined to be insignificant, and documentation of the consideration shall be made:</p> <ul style="list-style-type: none"> a) Repeatability (Type A) b) Resolution c) Reproducibility d) Reference Standard Uncertainty e) Reference Standard Stability f) Environmental Factors 				



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Requirement	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
	Compliance			
	Y	N	NA	
5.1.2 The measurement uncertainty shall also: a) Include those significant contributors that apply to the measurement.				
b) Include those significant contributors required by a method/procedure associated with the measurement.				
5.2 General Considerations				
5.2.1 The measurement uncertainty shall represent expanded uncertainties expressed at approximately the 95% level of confidence using a coverage factor of $k = 2$.				
5.2.2 The data from which the origin of the measurement uncertainty was determined shall be documented.				
5.2.3 The statistical analysis shall be in accordance with the <i>Guide to the Expression of Uncertainty in Measurement</i> (GUM).				

5.3 Deficiencies and Implementation			
NOTE TO ASSESSORS: _____ Check here if uncertainty records are documented <u>after</u> January 1, 2012. In this case, section 5.3 will then be considered “NA” and section 5.1 and 5.2 applies.			
Requirement	{RESERVED FOR A2LA ASSESSORS ONLY}		
	Compliance		
	Y	N	NA
For those measurement uncertainty records documented prior to implementation of P110 (January 1, 2012), a deficiency shall only be written:			
5.3.2.1 Where objective evidence reveals a “standard” contributor to be significant and is not documented and/or;			
5.3.2.2 Where objective evidence demonstrates any other contributor to be significant and is not documented and/or;			
5.3.2.3 Where the statistical analysis is not in accordance with the GUM.			

ANSI/NCSL Z540-1-1994 Additional Requirements – OPTIONAL *Italic type is used to indicate where Z540-1 differs from 17025 in otherwise similar requirements.*

Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
		Compliance			
		Y	N	NA	
NOTE TO ASSESSORS: ____ Check here if the CAB is NOT seeking optional accreditation for ANSI/NCSL Z540-1-1994. In this case this section will be considered as “N/A”.					
5.2 h) The quality manual and related quality documentation shall contain the laboratory’s scope of calibrations.					
5.4. The quality system adopted to satisfy the requirements of this Standard shall be reviewed <i>at least once a year</i> by the management to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements.					
10.2 a) Calibration procedures shall contain the required range and tolerance or uncertainty of each item or unit parameter being calibrated or verified. In addition, the procedures shall contain the generic description of the measurement standards and equipment needed with the required parameter, range, tolerances or uncertainties, and specifications for performing the measurement of the calibration or verification, and/or representative types (manufacturer, model, option) that are capable of meeting the generic description for the measurement standards. The procedures shall be consistent with the accuracy required, and with any standard specifications relevant to the calibrations/verifications concerned.					



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		Compliance			
		Y	N	NA	
10.4. Where it is necessary to employ methods that have not been well-established, these shall be subject to agreement with the customer, be fully documented and validated, and be available to the customer <i>and other recipients of the relevant reports.</i>					
11.5 Tamper-resistant seals shall be affixed to operator accessible controls or adjustments on measurement standards or measuring and calibration equipment which, if moved, will invalidate the calibration. The laboratory's calibration system shall provide instructions for the use of such seals and for the disposition of equipment with damaged or broken seals.					
13.2 Each certificate or report shall include at least the following information:					
a) a title, e.g. "Calibration Report", or "Calibration Certificate";					
b) name and address of laboratory, and location where the calibration was carried out if different from the address of the laboratory;					
c) unique identification of the certificate or report (such as serial number) and of each page, and the total number of pages;					

Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
		Compliance			
		Y	N	NA	
13.2 (cont.) Each certificate or report shall include at least the following information:					
d) name and address of customer, where appropriate;					
e) description and unambiguous identification of the item calibrated;					
f) characterization and condition of the calibration item;					
g) date(s) of performance of calibration where appropriate;					
h) identification of the calibration procedure used, or unambiguous description of any non-standard method used;					
i) reference to sampling procedure, where relevant;					
j) any deviations from, additions to or exclusions from the calibration method, and any other information relevant to a specific calibration, such as environmental conditions;					

Requirement	Reference	{RESERVED FOR A2LA ASSESSORS ONLY}			Comments
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		Y	N	NA	
13.2 (cont.) Each certificate or report shall include at least the following information:					
k) measurements (including where applicable "as found" data), examinations and derived results, supported by tables, graphs, sketches and photographs as appropriate, and any failures identified;					
l) a statement of the estimated uncertainty of the calibration results (where relevant);					
m) a signature and title, or an equivalent identification of the person(s) accepting responsibility for the content of the certificate or report (however produced), and date of issue;					
n) where relevant, a statement to the effect that the results relate only to the items calibrated;					
o) a statement that the certificate or report shall not be reproduced except in full, without the written approval of the laboratory.					
p) special limitations of use; and					
q) traceability statement.					



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		Y	N	NA	
13.6 b) The laboratory shall notify customers promptly, in writing, of any customer's measuring and test equipment found significantly out-of-tolerance during the calibration/ verification process. Measurement data shall be reported so that appropriate action can be taken.					
14.1 Where a laboratory sub-contracts any part of the calibration, <i>this work shall be placed with a laboratory complying with the requirements of this Standard [ANSI/NCSL Z540-1-1994].</i> The laboratory shall ensure and be able to demonstrate that its sub-contractor is competent to perform the activities in question <i>and complies with the same criteria of competence as the laboratory with respect of the work being sub-contracted.</i>					
16.2 Where a complaint, or any other circumstance, raises a concern regarding the laboratory's compliance with the laboratory's policies or procedures, or with the requirements of this Standard or otherwise concerning the quality of the laboratory's calibrations, the laboratory shall ensure that complaints in those areas of activity and responsibility involved <i>are promptly resolved.</i>					

Document Revision History

Date	Description
1/27/2012	<p>Removed Assessor signature line; added P109 and P110 to the assessor confirmation statement; added Conformity Assessment Body (CAB) and removed the term “laboratory” in the instructions; added “ NOTE TO ASSESSORS: ____Check here if none of the P109 technical consensus decisions applies and these sections (1b to 7a) will be considered as “N/A” in the P109 section; also added Y/N/N/A to this section and removed the reference blocks; added “and section 5.3 applies” to the P110 instruction for section 5.1 and added “a deficiency shall be written where objective evidence demonstrates that this policy has not been met” to section 5.1; added “and section 5.1 and 5.2 applies” to the P110 instruction for section 5.3 for clarity; added “NOTE TO ASSESSORS: ____Check here if the CAB is not seeking optional accreditation for ANSI/NCSL Z540-1-1994. In this case this section will be considered as “N/A” to the Z540-1-1994 section. Removal of instructions for laboratory to complete sections with a thick black border.</p>