

SAMPLE TEST LABORATORY  
EMAC PROFICIENCY TEST AND QUALITY CONTROL GUIDELINE  
FOR SCOPE OF ACCREDITATION TEST METHODS

**1 PURPOSE**

1.1 . This plan is designed to satisfy the requirements ISO/IEC 17025 paragraph 5.9 “*Assuring the Quality of Test and Calibration Results*” and the A2LA proficiency testing requirements (reference below in 2.3) by way of a Quality Control and Proficiency Test Plan. A combination of Participation in a formal Proficiency Testing Program (AEMCLRP), Internal Performance Based Data collection, Calibration Records, Preventative Maintenance Plans, Personnel Training and competence verification is used to satisfy this requirement. Great care has been taken to utilize existing recorded data from standard laboratory practices to ensure a cost effect and value added procedure. Also considered are the potential needs for intermediate checks to maintain confidence in the calibration status per ISO/IEC 17025 clause 5.5.10.

**2 REFERENCES**

2.1 . ISO/IEC 17025 1999

2.2 . LABORATORY XXXX QUALITY MANUAL, Revision XXX

2.3 . “*A2LA Proficiency Testing Requirements for Accredited Testing and Calibration Laboratories*”, January 1, 2004 (with July 2004 Update)

2.4 ISO/IEC 17011:2004(E) “*Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies*”.

2.5 *Automotive EMC Laboratory Recognition Program (AEMCLRP)*, September 2002

2.6 APLAC MR001, Issue 7, *Procedures for Establishing and Maintaining Mutual Recognition Arrangements Among Accreditation Bodies*.

2.7 ILAC P1: 2003 “*ILAC Mutual Recognition Arrangement Requirements for Evaluation of Accreditation Bodies by ILAC Recognized Regional Co-operations*” as well as APLAC, Reference 2.6, clause 3.3, “*Proficiency Testing Activities*”

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### 3 PERTINENT DEFINITIONS

- 3.1. **Proficiency Testing**: Within the context of this Quality Control and Proficiency Test Plan, this is the process to determine or confirm reasonable proficiency or competence in testing or measurement by various means. Such means includes, but is not limited to:
- Inter-laboratory comparison
  - Competence Audits
  - Alternate Measurement Means To Confirm A Measurement Or Test
  - Performance Based Evaluations, Checks, Or Data Collection
  - Technical Activity Audits
  - Regular Use Of Certified Reference Materials
  - Internal Quality Control
  - Replicate Tests Or Calibrations Using The Same Or Different Methods
  - Retesting Or Re-Calibration Of Retained Items
  - Correlation Of Results For Different Characteristics Of An Item
- 3.2. **Performance Based Activities** are the focus on activities that are significant to the achievement of a requirement or objective, including cost-effectiveness of a desired performance. Performance Based Activities can take the form of Evaluations, Checks, additional test monitoring, technical assessments, results correlation or Data collection.
- 3.3. **Major Sub-Disciplines Of Test Technology Or Methods or Processes**. Test standards or processes are very often very similar whether these appear in commercial standards, national, methods, military standards, automotive standards, etc. The Accreditation Body uses the term sub-discipline and is conservatively considered in this plan to be each separate categorization of the scope of accreditation.

### 4 INTRODUCTION AND BACKGROUND

- 4.1. The American Association for Laboratory Accreditation (A2LA), which is our Accreditation Body, consistent with the International Laboratory Accreditation Cooperative publication ILAC P1: 2003 *“ILAC Mutual Recognition Arrangement Requirements for Evaluation of Accreditation Bodies by ILAC Recognized Regional Co-operations”* as well as APLAC, Reference 2.6, clause 3.3, *“Proficiency Testing Activities”* imposes on its Accredited Laboratories a Proficiency Testing Program. Proficiency Testing, consistent with reference 2.7, may include various activities that are included in definitions of clause 4 above. It must be noted that ILAC p1:2003 clause 5.3.1 clearly states that; *“It is recognized that there are particular areas where proficiency is just not practical”*. Such areas include most EMC and Environmental Exposure tests that support the practical approaches of this plan.

Furthermore, the international standard for Accreditation Bodies, reference ISO/IEC 17011:2004(E) *“Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies”*, first edition clause 7.15.3 states:

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***"The accreditation body shall ensure that its accredited laboratories participate in proficiency testing or other comparison programmes, where available and appropriate, and that corrective actions are carried out when necessary. The minimum amount of proficiency testing and the frequency of participation shall be specified in cooperation with interested parties and shall be appropriate in relation to other surveillance activities.***

***NOTE 1: It is recognized that there are particular areas where proficiency testing is impractical. "***

A2LA requires that laboratories have suitably implemented the requirements and have a **documented plan** of how to cover the applicable program requirements or the major sub-disciplines and materials/matrices/product types on their scope of accreditation over a four-year period. This plan covers any commercially available participation and any intra- and/or inter-laboratory organized studies, as applicable. The laboratory must also be able to explain when proficiency testing is not possible for certain testing and this explanation must be included in the plan. When inter-laboratory comparisons (ILCs) or internal/external round robin programs, are not available or relevant to the scope of accreditation, internal performance-based data may be used. Internal performance-based checks (or data or evaluations) include (but are not limited to) the following types of activities: regular use of certified reference materials and/or internal quality control using secondary reference materials; replicate tests or calibrations using the same or different methods; retesting or re-calibration of retained items; and correlation of results for different characteristics of an item.

## **5 SCOPE**

5.1 . This plan includes only the tests that are included in the scope of accreditation.

## **6 TIMING AND PT/QC SCHEDULING**

6.1 . This is a 4-year plan with data to be submitted at least every 6 months from at least one of all sub-disciplines or test groups; however data in support of all sub-disciplines or test groups must be submitted in the 4-year period. A report must be submitted to A2LA every 3 months starting 3 months after the effective lab accreditation date. This report will state the status of the Proficiency Test Plan, changes to the plan, analysis of QC and PT results, and include any data needed to support the plan. Corrective action responses are generated for any unacceptable results with the corrective action record submitted to A2LA. Section 8 of this plan describes the submitted means to A2LA.

## **7 GENERIC QUALITY CONTROL ACTIVITIES TO ASSURE PROFICIENCY**

7.1. The following activities reflect the good quality practices used by the lab on a generic basis that enhances quality and proficiency:

The competence through internal performance based data program includes:

- Adequacy of test setups, alignment of test setups consistent with test plan requirements; assurance that all changes are fully documented with justification in the appropriate test documentation and lab reports; conducting proficiency tests of Lab test personnel;

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- Review of capability that the laboratory possesses the necessary physical, personnel and information resources, and that the laboratory's technical personnel have the skills and expertise necessary for the performance of the tests and/or calibrations in question. The review may also encompass results of earlier participation in inter-laboratory comparisons or proficiency testing and/or the running of trial tests using samples or items of known physical characteristics in order to determine uncertainties of measurement, limits of detection, confidence intervals, etc.
- Personnel performing tasks requiring special skills are qualified prior to performing the work. Such personnel are Qualified/Certified based on demonstrated proficiency of each candidate and periodically thereafter to maintain skills to meet required practice.
- The technical manager or supervisor audits the performance of the qualified personnel at least every two years. As a result of this audit, an employee can be disqualified from doing accredited work, be required to be retrained and be re-qualified if the amount of errors and/or problems with quality warrant such action.
- The selected methods are appropriate for the type and volume of the work undertaken.

Note – PT/QC reports should be submitted to A2LA at 6-month intervals and should contain a review (i.e. Test ID's, charts, plots, internal audits, Validation Engineers/Lead Tech sign off – test reports, A2LA - technician test matrix, etc.) of the objective evidence in a summary report.

## **8 REQUIRED TESTS AND DOCUMENTATION**

8.1 . **Radiated Immunity** competence is demonstrated through the AEMCLRP Program per Appendix E, G, H, I, N, O, of the program. This program may require Artifact testing every 2 years and the data to be submitted to A2LA. System verification data may also be submitted when periodic checks are made in the time period between the 2-year intervals. Equipment calibration records and employee training records shall also be available for inspection.

8.2 . **Radiated Emissions (RE)** competence is demonstrated through the AEMCLRP Program per Appendix K, L, M of the program. This program may require Artifact testing every 2 years and the data to be submitted to A2LA. System verification data (taken with a Reference Radiator) and chamber quiet sweeps may also be submitted when periodic checks are made in the time period between the 2 year intervals. Equipment calibration records and employee training records shall also be available for inspection.

8.3 . **Electrostatic Discharge (ESD)** competence is demonstrated through the AEMCLRP Program per Appendix F of the program. This program requires the submission of waveforms to verify the ESD events every 2 years and the data to be submitted to A2LA. Quarterly waveform verifications (required for automotive ESD testing) may also be submitted when these period checks are made in the time period between the 2-year intervals. ESD gun voltage verification is done daily prior to each injection voltage level. This voltage is monitored by a calibrated Electrometer as required in most ESD specifications. This data is included with each test report and is available for inspection. Equipment calibration records and employee training records

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shall also be available for inspection.

- 8.4 . **Conducted Transients and Abnormal Voltages** competence is demonstrated through internal performance based data. The transient generator waveform voltage levels are verified daily by a Digital Storage Oscilloscope before each injection sequence. These waveforms are included with each report and are available for inspection. Every 6 months, the waveform energy content and shape will be verified per ISO 7637-2.3. This data will shall be submitted to A2LA in support of lan. Equipment calibration records and employee training records shall also be available for inspection.
- 8.5 . **Sinusoidal Burst** competence is demonstrated through internal performance based data. A Digital Oscilloscope before each injection sequence verifies the transient generator waveform voltage levels into a 50-ohm load. These waveforms are included with each report and are available for inspection. Equipment calibration records and employee training records shall also be available for inspection.
- 8.6 . **Conducted Emissions** competence is demonstrated through internal performance based data. System Verification data (using a Reference Comb Generator) shall be run every 6 months to verify system performance. This data shall be submitted to A2LA in support of this plan. Equipment calibration records and employee training records shall also be available for inspection.
- 8.7 . **Conducted Transient Emissions** competence is demonstrated through internal performance based data. The voltage transients are measured with a Digital Storage Oscilloscope. These waveforms are recorded in each report and are available for inspection. Samples of these waveforms shall be submitted to A2LA in support of this plan. Equipment calibration records and employee training records shall also be available for inspection.
- 8.8 . **Over/Under, Reverse, Jump Start Voltages** competence is demonstrated through internal performance based data. These voltages are recorded by a digital voltmeter and recorded in each report. Reports, equipment calibration records and employee training records shall be available for inspection.
- 8.9 . **Temperature Cycling** competence is demonstrated through internal based performance data. The test chambers are of high quality and capable of maintaining an environment of approximately +/- 1 degree Celsius. An independent chart recorder verifies the chamber temperature throughout the test. The tests specifications only require the temperature to be within +/- 5 degrees Celsius of the set point. This chart is included with each test report. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.10 . **Humidity Exposure** competence is demonstrated through internal based performance data. The test chambers are of high quality and capable of maintaining an environment of approximately +/- 5 % RH. An independent chart recorder verifies the chamber temperature throughout the test. The tests specifications only require the temperature to be within +/- 10% RH. This chart is included with each test report. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.

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- 8.11 . **Temperature Exposure** competence is demonstrated through internal based performance data. The test chambers are of high quality and capable of maintaining an environment of approximately +/- 1 degree Celsius. An independent chart recorder verifies the chamber temperature throughout the test. The tests specifications only require the temperature to be within +/- 5 degrees Celsius of the set point. This chart is included with each test report. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.12 . **Thermal Shock** competence is demonstrated through internal based performance data. The test chambers are of high quality and capable of maintaining an environment of approximately +/- 1 degree Celsius. An independent chart recorder verifies the chamber temperature throughout the test. The tests specifications only require the temperature to be within +/- 5 degrees Celsius of the set point. This chart is included with each test report. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.13 . **Fluids Compatibility** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.14 . **Drop, Free Fall, Random Drop** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.15 . **Functional/Parametric Test** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.16 . **Connector Insertion/Extraction** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.17 . **Knob Rotation, Knob Abuse Test** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.18 . **Pushbutton Durability, Switch Mounting Durability** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.19 . **Visual Inspection** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.20 . **Vibration** competence is demonstrated through internal based performance data. The vibration is controlled via an accelerometer mounted to shaker. A second independent accelerometer records the actual vibration profile and this profile is included with each test report. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.

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- 8.21 . **Mechanical Shock** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.22 . **Solar Test Exposure** competence is demonstrated through inter-laboratory Total Normalized Radiation (TNR) comparison between the GM Desert Proving Ground Solar Exposure Laboratory in AZ (or equivalent) and MTC every 2 years (The Mexico Technical Center TNR must not be 12% below Az); calibration records and Equipment verification data.
- 8.23 . **Color Evaluation** competence is demonstrated through internal Reports, equipment calibration records, employee specialized qualifications and training records ..
- 8.24 . **Gloss Evaluation** competence is demonstrated through internal Reports, equipment calibration records, employee specialized qualifications and training records ..
- 8.25 . **Degradation Evaluation** competence is demonstrated through internal . Reports , employee experience ,technical background, specialized qualifications and training records .
- 8.26 . **Squeak and Rattle / Audible Noise** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.27 . **Water Spray** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.28 . **Thermal Shock / Water Immersion** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.
- 8.29 . **Corrosion /Salt Spray /Salt Fog** competence is demonstrated through internal based performance data. Reports, equipment calibration records, preventative maintenance records, and employee training records shall be available for inspection.

## 9 **REPORTING**

- 9.1 . Data shall be reported using the A2LA Proficiency Testing Data Submission Form. This form shall be submitted to A2LA with all the pertinent data attached.

Prepared By : \_\_\_\_\_  
Name & Title / Date

Reviewed & Approved By:

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Lab Manager Facility Manager /Date