

# PJLA Update Notification

## Update Notification # 11

**Update Notification Release Date:** Sept 07, 2010

**Form/Procedure/Policy:** Update to classification of measurements performed with Coordinate Measurement Machines-CMM(s)

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PJLA Applicant/Accredited Laboratories

CC: PJLA Assessors and Staff

PJLA has traditionally viewed measurement activity employing CMMs as Dimensional Inspection and classified it as a testing activity. Laboratories accredited for this activity were issued a testing certificate rather than a calibration certificate. The distinction between Dimensional Inspection and Calibration has always been vague and any decision with regard to classification was understood to be subjective to some degree. Given the high level of dimensional accuracy available with modern CMM(s), the sophistication of software and enhanced measurement capabilities more CMM(s) are finding their way into calibration laboratories. For these reasons, PJLA has recognized the need to review our position on the classification of measurement activity employing CMM(s). The results of this review and the reasons for conclusions reached as a result are detailed below.

### What is calibration?

Calibration as defined in the VIM (International vocabulary of metrology — Basic and general concepts and associated terms, Section 2.39) is an:

*“operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication”*

A more basic and generally accepted definition is the comparison of the calibrated parameter of a unit under test (UUT) to the corresponding parameter of an identified standard. For example, the comparison of the length of a gage block (the UUT) and a length standard which is ultimately traceable to the SI unit of length defined in terms of the speed of light in a vacuum.

The majority of times that a CMM is employed to perform a measurement or series of measurements on an object it is for the purpose of comparing the measurement results against a “standard”. The standard is typically a part or assembly print, which consists of a visual representation of the UUT along with the dimensions, specification and notation that comprise its physical definition.

Often times, this “physical definition” exists only in the silicon memory of a CAD (Computer Aided Design) system and takes the form of a “Solid Model”. This application technically satisfies the definition of comparison to a standard even though that standard is defined alpha numerically on a blueprint or mathematically in computer memory. The distinction between whether the results of this measurement represent a calibration or a dimensional inspection is

related to the purpose for which the measurements are made and the end use of the measurement results.

For example, assume that a laboratory measures a dimensional feature or series of dimensional features of a stamping. If the objective of these measurements is to verify that when compared to the associated part drawing or model all measured features are within specification and that the stamping is therefore acceptable for use, this would be considered dimensional inspection. The purpose in this case, is to answer questions about the suitability of the stamping for its intended use as a product or a component of a product. Measurement of the stamping in all likelihood will not be repeated after the initial evaluation other than as a diagnostic tool should problems arise during the course of its expected service life. Traceability for the measurement results will exist at the time the measurements are performed to confirm the validity of the results at the time they are obtained. Typically, efforts to maintain traceability of the measurement results are not required after the initial inspection.

On the other hand, if the laboratory measures a feature or series of dimensional features of a dedicated gage intended for use in inspecting or verifying the corresponding features of the stamping mentioned above, this would be considered calibration. In this case, the purpose is to validate a gage, which can now be used in answering the questions referred to above with regard to suitability for use. Periodic measurement or calibration of the same features will be performed on a scheduled basis along with the issuance of calibration documentation and performance tracking over time to ensure continued suitability for use as a gage.

*Results/Changes from Analysis:*

PJLA will continue to accredit laboratories that perform dimensional inspection, as defined above. These laboratories will be issued a certificate of accreditation for testing, as in the past. Laboratories that perform calibration, as defined above, will receive a certificate of accreditation for calibration. This change will be implemented for new accredited laboratories whose accreditation becomes effective as of October 1, 2010. Current accredited laboratory's scope of accreditation will be updated to reflect these requirements upon renewal. All laboratories will be required to revise their scope of accreditation to meet the above requirements by no later than October 1, 2012.

This review was performed as part of a continual effort to improve the services PJLA offers to its clients and to permit laboratories to more effectively address the needs of their clients. If you have any questions in regards to this classification, please feel free to contact Henry Alexander, Calibration Program Manager at [halexander@pjlabs.com](mailto:halexander@pjlabs.com).

Thank you.