



Introduction

Section 6.3.1.1 of AASHTO R 18 requires that the laboratory establish procedures to follow for the calibration or standardization of equipment; and when that equipment is used over several measurements, the procedure must specify which measurements over the range of use shall be taken.

This document defines the minimum number of measurements required for equipment calibration or standardization records when not defined in the manufacturer's instructions or a calibration standard.

Terminology

Range of use – The minimum and maximum measurements that a piece of equipment will be used for over the course of testing services.

Discussion – If multiple points are required over a range of use, those points must be relatively evenly distributed among the range.

Range of Use Requirements

The tables presented below specify the minimum requirements that shall be met:

Working Equipment	Requirement
Thermometers	Refer to the AASHTO Accreditation Program's Policy and Guidance on Thermometer Selection and Records .
Balances	At least 5 points covering the range of use
Variable Length Measurement devices (ex. Calipers)	If used at a single test point , the unit under test shall be standardized at that single point, within the tolerances for which the equipment is being used.
Non-Variable Length Measurement devices (ex. Rulers)	If used over a range of measurements , the unit under test shall be standardized at a minimum of 3 points covering the range of use.
Ovens	
Vacuum/Pressure Measurement devices	If there are specific requirements in a standard for standardization, those requirements and this document shall be followed.
Time Measurement Devices	
Compression, Loading, or Tensile Testing Devices	



AASHTO Accreditation Policy on Range of Use Requirements

All reference equipment shall be calibrated by an ISO/IEC 17025 accredited agency or by manufacturers who perform proprietary calibrations on the equipment they produce. Estimates of measurement uncertainty and /or a measurement uncertainty statement are required. In addition, the readability and accuracy of the reference equipment shall meet or exceed that of the working equipment being standardized.

Reference Equipment / Measurement Standards	Requirement
Thermometers	Refer to the AASHTO Accreditation Program's Policy and Guidance on Thermometer Selection and Records .
Standard masses	At least 4 masses covering the range of use of the balance. ¹
Standard Gauge Blocks	Enough blocks to cover the range of use. ¹
Standard Load Cells	Measurement standards shall be calibrated so that the range of calibration test points encompasses the range of use of the equipment that will be standardized or checked using the measurement standards.
Standard Pressure/Vacuum Meters	

¹ For measurement standards that exist as single point measurements (masses, gauge blocks, etc.), the set shall include sufficient parts to be used individually and as a combination in order to meet the range of use of the equipment being standardized or checked.