

Factory-set Calibration Curve Verification (NC WW/GW LC Policy 10/05/2018)

Most field photometric instruments have factory-set calibration programs, which when selected in combination with the optimum wavelength for a particular analysis, give a direct readout in concentration. These factory-set calibration programs are acceptable for quantitation, but due to possible analyst error, variation in sample or standard preparation, variation in reagents or malfunction of the instrument, the factory-set calibration curve must be verified as described below.

Calibration curve verification checks must be performed with the calibration curve and/or program used for sample analysis. All compliance monitoring and Proficiency Testing (PT) Samples must be analyzed on the applicable verified calibration curve. Each curve or program used by the laboratory must be verified. The range of standard concentrations must bracket the permitted discharge limit concentration, the range of sample concentrations to be analyzed and anticipated PT Sample concentrations. One of the standards must have a concentration equal to or less than the permitted discharge limit.

Annual Calibration Curve Verification

When an annual factory-set calibration curve verification is performed, it must be performed initially, at least every 12 months and prior to sample analysis after the instrument optics are serviced. Zero the instrument with a Calibration Blank and then analyze a Reagent Blank and a series of at least five standards. The concentration of the Reagent Blank must not exceed 50% of the reporting limit or as otherwise specified by the reference method. Compare the measured concentration of each standard to the expected value. Each calibration verification standard must be within $\pm 10\%$ of its expected value unless different criteria are specified in an individual method. At the lower limit of the operational range, acceptance criteria may be wider. Such criteria must be defined in the laboratory's Standard Operating Procedure (SOP) or Quality Assurance Manual (QAM). If the measured concentrations vary by more than the stated acceptance criteria, the factory-set calibration curve must not be used for compliance monitoring until troubleshooting is carried out to determine and correct the source of error.

Daily Calibration Curve Verification

When a daily factory-set calibration curve verification is performed, it must be performed each day compliance samples are analyzed. Zero the instrument with a Calibration Blank and then analyze a Reagent Blank and a series of at least three standards. The concentration of the Reagent Blank must not exceed 50% of the reporting limit or as otherwise specified by the reference method. Compare the measured concentration of each standard to the expected value. Each calibration verification standard must be within $\pm 10\%$ of its expected value unless different criteria are specified in an individual method. At the lower limit of the operational range, acceptance criteria may be wider. Such criteria must be defined in the laboratory's standard operating procedure or quality assurance manual. If the measured concentrations vary by more than the stated acceptance criteria, the factory-set calibration curve must not be used for compliance monitoring until troubleshooting is carried out to determine and correct the source of error.