

The Right Tool for the Job: Proper Instruments Ensure Accuracy and Reduce Uncertainty



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NEBB recently determined the need to examine its instrument list focusing on calibration and accuracy. The first Certelligence recertification cycle is nearing completion and has led to the formation of a comprehensive instrumentation list. While it is not our intention to produce an ever-changing list of instruments meeting the published requirements, we specifically indicate the prerequisites of each.

In general terms, a unit means the type of measurement, and normally symbols are used to identify them which are standardized and grouped into a system such as US or SI Standard Systems of Measurement. An air pressure measuring instrument, for example, has a specified range in both US and SI units as well as for the accuracy and resolution requirements. The NEBB board of directors (BOD) recently approved an instrumentation information bank that provides a reference for basic requisites in US and SI per discipline, and other disciplines where that tool may also be appropriate. The range, accuracy, and resolution (RAR) has been matched to meet the needs per the Procedural Standards, specifying an instrument that meets the basic requirements which fits NEBB's main goal of providing an accurate list for each discipline and a cross reference for firms that have multiple certifications or are planning to acquire them in the future

Each NEBB Procedural Standard will be updated with the appropriate errata and will include a complete NEBB-Approved Instrument List and a discipline-specific list. These will also be posted on the NEBB website and on Certelligence during the certification or recertification processes. A major change on the list is the requirement of ownership of sound measurement instrumentation. With the abundance of manufacturers producing high-quality, low-cost instrumentation in this field along with an increased call in the specifications, it was recommended that these sound measurement instruments meet the NEBB model of ownership.

One of the most complicated issues that arose during deliberations with various committees and the NEBB BOD was the calibration of some of the complex or combination systems such as blower doors or thermal imaging cameras. While a fan is not calibrated, it should be checked periodically for proper alignment and operation. However, the gauge calibration requirement is for a 12-month cycle following the three-point NIST Traceable Certification. Various thermal imaging cameras require different calibration protocol dependent upon manufacturers' procedures that are not specifically defined elsewhere so NEBB still requires a 12-month calibration period.

All required intervals and procedures have been outlined per instrument on the NEBB-Approved Instrument List and are to be followed for all NEBB Certified Reports, New Firm Certification and/or Recertifications. NEBB-required instruments must meet the RAR, ownership, and calibration requirements as indicated on the NEBB-Approved Instrument List. Calibration is a measurement process that assigns values to the response of an instrument relative to reference standards.

The purpose of calibration is to eliminate or reduce bias in the user's measurement system relative to the reference base. For continued accurate performance of an instrument, it must be calibrated at minimum within 12 months, unless otherwise specified. A minimum three-point calibration should also be conducted at an accredited NIST Traceable facility by a certified technician in the United States or labs such as NPL in the UK, NIST in the USA, or PTB in Germany. A nationally or internationally recognized standard provides an unbroken chain of measurements back to maintained standards, documented

uncertainties throughout the chain, and a quality assurance system to quantify that uncertainty. The three-point calibration verifies the accuracy of an instrument in the High-Middle-Low points in the required range of the instrument. For example: a temperature measurement instrument listed with a range of -20°F (-30°C) to 240°F (120°C) may have test points at 15% (20°F), 50% (110°F), and 85% (200°F) verifying the instruments accuracy throughout the range rather than at a single point.

NEBB, through its standards and education, has developed procedures and requirements for all NEBB Certified Firms, Professionals, and Technicians performing the tasks required by NEBB Procedural Standards and project specifications. The NEBB Procedural Standards mandate the performance of testing per the specified standard along with project-specific responsibilities, and requires the use of specialized and accurate instruments to perform the task and issue NEBB-Certified Reports. While each discipline has specific tasks and instrument requirements, the NEBB-Approved Instrument List allows for a comprehensive analysis and consolidation of the same applications in various disciplines into one. Bottom line: The purpose of instrument requirements is to ensure the proper tools are used to perform the required task. ■