

Standardizing Timers and Stopwatches

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Whether monitoring strain rates, determining flow speeds, or establishing drying intervals, timing is an important part of laboratory testing. There is a need to ensure that measurements taken with timing devices are meaningful and accurate. Timing is such a critical component of laboratory testing that AASHTO R 18 requires that stopwatches and timers used for testing are standardized at least every six months for some test procedures. By standardizing timers and stopwatches, the user can feel confident in the accuracy of the measurements taken with them.



What are some acceptable methods of standardizing timing devices?

Any method used to standardize timing devices must ensure that the device is traceable to a national standard. The following methods have been found acceptable for standardizing timing devices used in most construction materials testing applications:

NIST Time Signal Radio Station, WWV

The NIST Time Signal can be reached by calling (808) 335-4363. The uncertainty of the radio tones received through this phone call is estimated to be less than 1 millisecond. While operator error does introduce additional variability into the measurement uncertainty, it is still one of the most widely accepted methods of establishing the traceability of timing devices.

Comparison to a Traceable Timer or Stopwatch

A calibrated, traceable timer or stopwatch can be purchased relatively inexpensively and used as a reference instrument to standardize other timing devices in the laboratory.

Standardization by an Outside Agency

Standardization of timing devices may be completed by an outside agency. However, due to the six-month standardization frequency, as well as the associated costs, many laboratories may find this method expensive and cumbersome. Timer and stopwatch standardizations are relatively easy to perform in-house by either of the methods described above.

Are There Any Methods of Standardization that are NOT Acceptable?

Yes. The NIST time display website, <http://www.time.gov>, or any other website, are not acceptable time standards to use for the standardization of timing devices. These types of time displays inherently lack traceability due to the resetting of the computer's internal clock. In addition, fluctuation in internet connection speeds makes these types of displays unreliable and inaccurate.

Where can I find additional information on Timer and Stopwatch Standardization?

Additional information on this subject may be found in the NIST Special Publication 960-12 entitled "[NIST Recommended Practice Guide: Stopwatch and Timer Calibrations](#)," published in May 2004.

Editor's Note: This article was updated in June 2016.