

Getting Rid of Mercury: A New Frontier for Temperature Measurement

By [Maria Knake](#), Laboratory Assessment Program Manager
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These are exciting times in the world of thermometry. Due to the efforts of the Interstate Mercury Education and Reduction Clearing House (IMERC), the way that we take temperature measurements is almost certainly going to change. The initiative has prompted states across the country to reduce the use of mercury and products containing mercury. As concerns over the use of mercury continue to grow, this trend is expected to continue. Several commonly used AASHTO and ASTM standards still require the use of liquid-in-glass thermometers for testing. The recent developments in mercury regulation have caused quite a stir in the construction materials testing community.

Specifying Alternatives to Liquid-in-Glass

Many choices exist for thermometers today: platinum resistance thermometers, thermistors, thermocouples, infrared thermometers, and non-mercury liquid-in-glass thermometers, just to name a few. Each of these thermometers has appropriate uses in the laboratory. Standards developers are coordinating their efforts with thermometry experts to specify proper alternatives for each test method. This is not an easy task, and there are several issues that need to be considered before making these changes. Each thermometer specified has unique circumstances that must be closely evaluated. It is critical that any alternatives to devices currently used do not significantly change the results of the testing performed. One of the obstacles facing standards developers in many test procedures is response time. This issue is especially important for tests that specify a particular rate of rise in temperature over an interval of time. It is critical to specify a device that will display temperature changes at a similar time interval to the liquid-in-glass thermometer it is replacing. In addition, the stability of measurements over time and immersion depth can have significant effects on temperature measurements. Accuracy, ruggedness, cost, and usable temperature range of available alternative devices will also play a role in the decision-making.

AASHTO re:source's Policy on Liquid-in-Glass Thermometers

Many of our customers have expressed concerns about the use of alternatives to liquid-in-glass thermometers during AASHTO re:source's on-site assessment at their facilities. If the laboratory is restricted in their use of mercury due to state regulation, the use of an appropriate alternative to liquid-in-glass will not be noted in the laboratory's assessment report, even if an alternative to liquid-in-glass is not specified in the test method.

For More Information

For more information on alternatives to liquid-in-glass thermometers, feel free to [contact AASHTO re:source staff](#). Another resource on choosing alternatives to liquid-in-glass thermometers is [Selection of Alternatives to Liquid-in-Glass Thermometers](#), by Dean C. Ripple and Gregory F. Strouse (ASTM International 2, JAI13404, 2005).

(Editor's Note: This article was update August 2016 to ensure accuracy.)