

# Noninvasive Moisture Meters

Rapid readings can speed construction and ensure quality

**E**nsuring that materials are dry or have an optimum moisture content can be critical to the success of a construction project. Failure to measure moisture content can increase risks for quality issues, mold, and excessive dimensional changes. Uncertainty about moisture levels in all materials, including aggregates, concrete, and adhesives, can result from exposure to precipitation, plumbing leaks, or variations in relative humidity.

Moisture meters typically require calibration, sampling, and time. In addition, they may not be suitable for measuring moisture in a variety of materials. Many devices or methods are not portable enough to be used on jobsites. Fortunately, alternative, handheld moisture measurement devices are available for construction workers. With no special training, workers can use these devices to obtain measurements instantly on a wide range of materials. Whether measurements are required for aggregate, concrete, adhesives, or dimension lumber, these tools help expedite project completion and improve building quality, and they can be leased for as little as \$20 a day.

## Simplifying Moisture Measurement Near-infrared light

Devices based on near-infrared (NIR) light can deliver immediate, laboratory-quality moisture readings. “NIR moisture meters allow very accurate instant measurement of solids, slurries, and liquids without contact or sample preparation in portable handheld models,” according to John Bogart, Managing Director of Kett US, a manufacturer of a full range of moisture and organic composition analyzers.

Bogart said that once a meter has been calibrated against standards, the calibrations are stored in different “channels” in the unit, each dedicated to a specific type of building material. The user simply selects the proper channel and the measurement is instantly displayed. NIR moisture meters are based on the principle that water absorbs certain wavelengths of light. Light projected from the device resonates with water molecules, and a portion of the light is absorbed. The NIR device measures the reflected light, and the result is automatically converted into a moisture content reading.



The Kett KJT130 portable NIR moisture meter operates on camcorder batteries or 110V AC



The Kett HI520-2 portable moisture meter for concrete, mortar, and drywall applications

At a construction site, an NIR meter could be used to instantly check the moisture level of bulk “dry” goods like sand or aggregate, or it could be used to spot-check the moisture content of a batch of materials mixed with water. “An NIR meter can determine if mastic or adhesive has the correct moisture content to properly bond floor, wall, and ceiling tiles so creep, shrinkage, buckling, or grout problems do not become an issue,” Bogart said.

## Contact

Portable contact gauges are also available. Gauges specifically designed for concrete use high-frequency capacitance to measure moisture content. They are calibrated for normalweight concrete, lightweight concrete, mortar, and drywall; and a fifth mode allows the user to create calibrations on nonstandard products. Measurements are instantly displayed on a liquid crystal display.

Contact gauges suitable for aggregates use electrical resistance to measure moisture content. The user calibrates a device by taking measurements on three to five samples with known moisture contents. After inputting the known values, the calibration is stored until the user changes it.

—Kett, [www.kett.com](http://www.kett.com)

Selected for reader interest by the editors.