

# Are Test Strips Still Relevant For Water Analysis?

By Taylor Reynolds

Today's environmental laboratories are audited and accredited companies where quality control (QC) and quality assurance (QA) reign. Advanced technology is needed to measure parameters for regulatory compliance down to parts per billion.

In a world of regulatory mandates, can test strips still be used for water analysis?

## Use And Benefits Of Test Strips

Test strips **are** valuable for process control at industrial, water, and wastewater treatment plants. They're portable, easy for operators to use, and provide quick results to indicate whether process adjustments need to be made.

Most regulatory permits require testing of various parameters daily or weekly. In addition to process control, operators can get immediate feedback to ensure the treatment plant is in compliance on non-test days. Operators can use test strips to indicate potential problems in between compliance sampling periods. And for finicky processes that need fine-tuning, test strips help operators refine settings to produce the highest quality water.

Another advantage is that test strips are very inexpensive compared to laboratory testing. Compare the cost of a laboratory technician, chemicals, labware, and overhead to test strips. A lab-tested sample costs tens of dollars per test versus a few cents per test strip. The difference can add up to a large cost advantage for test strips. Budgets are almost always strained, so these cost savings are important.

## Test Strip Parameters

Most users think of strips for measuring pH, and while that is undoubtedly the most common use, there are a large number of applications where pH strips can be used at a treatment plant.



Some common uses for wastewater analysis include test strips for ammonium, nitrate, nitrite, and phosphate. Test strips for disinfection include chlorine, peroxide, and peracetic acid (PAA), a newer disinfectant for municipal effluent.

For drinking water, test strips for iron and calcium are available. Test strips can also be used to measure total hardness, carbonate hardness, chloride, lead, manganese, potassium, and other parameters.

Numerous industries, including food and beverage, electroplating, and pharmaceutical, use test strips as well. Available parameters include glucose, zinc, molybdenum, ascorbic acid, peroxidase, cyanide, nickel, cobalt, arsenic, and more.

Water professionals may not realize how much trouble and expense they can save by using test strips to manage their process.

## How Accurate Are Test Strips?

When it comes to accuracy, not all test strips are the same. The level of accuracy depends on the specific test strip. Also, some compounds in the source water or matrix may cause interference with the tests. However, test strips are true high-tech products and quite accurate overall.

To assure high quality, the manufacturer should use certified standard solutions to adjust and check the strip's reference colors. These standard solutions should be directly traceable to primary reference standards from NIST.

Test strips are available in different ranges for increased accuracy. For example, tests trips to measure pH come in the universal range of 0 to 14 standard units. Additionally, they are available in nine narrower ranges, such as 0 to 2.5 for better accuracy and precision. There's even a special indicator range for one of the food industries of 5.2 to 7.2.

Other test strips are available in different ranges also, such as ammonium test strips which are available from 10 – 30 – 60 – 100 – 200 – 400 mg/L. Some test strips measure to very low levels, such as 0.5 mg/L for nitrite.

### How To Use Test Strips

As noted previously, test strips are extremely quick and easy to use. Simply wet the reaction zone by dipping the test strip into the solution being tested. Shake off the excess liquid. Then wait the specified time, no more than two minutes. Compare the color on the strip with the color scale on the package to determine the parameter's concentration.

Used test strips may simply be thrown away, as they contain only a minute amount of reagents.

### New Feature

Material advances are always in the works. One of the latest, from MilliporeSigma, is mounting the strip on clear plastic. The transparent strip allows testing of substances that would normally occlude the surface of the test strip. Instead, the color is evaluated on the reverse side of the strip, where interfering substances are negligible. This is perfect for testing turbid samples or wastewaters contaminated with fats, oils, and grease. These strips eliminate the need for sample preparation steps such as filtration or clarification, saving valuable time.

### Test Strips Are Still Useful

The short answer to the question, "are test strips still relevant for water analysis?" is yes. They are used at municipal and industrial facilities every day and should be used to supplement process control checks. ■

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