



**A**nyone in the water treatment business does some amount of testing while in the field or on the job site. There are a variety of testing products available, and each has its advantages and disadvantages depending on how and where it will be used. Knowing how you are going to use the tests and under what conditions will help you make the right choice.

Let's first discuss the different types of water treatment. There is residential treatment, in which products are intended for homes or small businesses. Commercial is similar to residential in the types of treatment techniques applied, but on a much larger scale. Many times, individuals working in the commercial treatment industry are certified operators because they operate public water systems. Then there is

industrial treatment, in which operators treat boilers and cooling tower waters as well as wastewater from manufacturing plants. Each of these types has different needs in terms of what it wants to accomplish, but each does testing on site, which affects the type of test kit or meter selected.

A residential water treatment company typically uses onsite testing in two ways: first, in a sales demonstration and second, to appropriately recommend and size equipment. Many water treatment companies selling water softeners use a precipitation test to demonstrate the presence of hardness minerals.

Additional tests for iron or manganese may be done if there are indicators—such as staining on fixtures and laundry—because this may affect the efficiency of the softener. Water treatment companies may also test for pH, total dissolved solids or conductivity because they are important factors in determining treatment needs. Depending on the customer, the company may also opt to have samples sent to a laboratory to test for more difficult parameters or to confirm what was tested for in the field.

Commercial water treatment deals with water treatment on a much larger scale, usually in a water treatment plant intended to supply the public with water. Many dealers who work on commercial systems are certified operators. In order to become a certified operator, one must undergo training, testing and field experience. If operating a public water supply, one must use only testing methods approved by the U.S. Environmental Protection Agency.

Industrial water treatment is broken down into three categories: boiler, cooling and wastewater. The main water quality issues addressed include scale buildup, corrosion, microbiological activity and wastewater residual disposal. Scale buildup, corrosion and microbiological activity are big problems for cooling and boiler waters. Scale buildup is a layer of minerals depositing on a surface, with the most common culprits being calcium and magnesium. Scale buildup is a problem because it acts as an insulator and affects the heat exchange, which therefore reduces efficiencies and necessitates the use of more treatment chemicals and energy. It is estimated that a 1/64-in. thickness of scale can reduce the efficiency of a system by about 15%, which can translate to significant capital loss.

Corrosion refers to the deterioration of a material, most commonly metal. Metals lose electrons as they react with water and oxygen, so water being stored in metal can create corrosion issues. Corrosion is a big problem because it can lead to leaks, which can cause massive failures in pressurized systems. Microbiological activity in cooling water can lead to problems with public health such as Legionnaires' disease, which

is traced back to improperly managed cooling towers. The untreated water in cooling towers provides microbes the ideal breeding ground, so the levels of microbes should be properly managed by adding appropriate amounts of biocides. If too little is added, it will not be effective, and if too much is added, it will waste money. Testing the ORP level helps determine the correct level of biocide needed, which will save money and provide effective protection.

#### What Others are Using

Jeffrey Hodgson, a water dealer with Agway Water, Grove City, Pa., uses a combination of testing kits and tools to help in determining the proper water treatment equipment. Agway's customers typically have problems with sulfide and iron, and determining levels of sulfide and the type of iron is key in proper treatment. Hodgson depends on a variety of colorimeter kits from Hach and LaMotte that test for common parameters like pH, iron hardness, sulfides and nitrate. He prefers Hach for testing iron because the test he runs allows him to determine which form of iron is present.

In addition to running these tests, Hodgson uses a variety of tricks to help determine water quality. He calls this "letting the water talk to you." Hodgson uses simple tools like a Styrofoam cup to determine if ferrous iron ( $Fe^{2+}$ ) is present, to more complex tools like a couple of filter cartridges plumbed together. Testing the raw water and what comes out of the filter is helpful in determining the right treatment equipment for the job.

Jeff Roseman, a water treatment professional with Aqua Ion Plus in LaPorte, Ind., uses a variety of colorimeter kits from Hanna Instruments. Because he works on many different types of projects, he appreciates the large selection that Hanna offers. Roseman has been using this company for years because it is affordable and easy to use. He commonly tests for iron, hardness, nitrate and manganese. Roseman has found that Hanna's kits offer him consistent and accurate test results he can depend on when recommending and sizing treatment equipment.

Because Superior Water Co., Gilbertsville, Pa., is a privately owned public water supply, Tom Leach said they are required to perform chlorine testing at all the sites to ensure they are meeting the requirements of the Department of Environmental Protection (DEP). Superior Water uses a Department of Planning and Development method provided by Hach because it is an approved method as required by the DEP.

Jason Black with Water Conditioning, Gardeners, Pa., is a certified operator in the state of Pennsylvania, which means he is certified to operate public water systems. He also uses a variety of Hach colorimeter test kits because many are approved methods to meet the state's requirement.

### Finding What's Right for You

There are a variety of onsite testing options available to meet the needs of the different applications that are out there. It can be tough finding the right one for you, so here are a few helpful hints: First, determine what tests you would like to run. This will differ based on the type of water you are testing. If you are mainly dealing with well water, you may be testing for things such as bacteria, iron, manganese and hardness, whereas when dealing with city water, chlorine and trihalomethanes may be a bigger concern.

Once you have the list of items you want to test for, you need to find out what kind of range you will need. The range is the expected level, which you can get an idea of by talking to other water treatment professionals, health department officials and local USGS.

Once you know what you want to test for and the levels you need to achieve, talk to the manufacturers about what they have available. Take them up on their offers of demo units and try out the equipment or test methods. Find the equipment and test method you are most comfortable running. Some other things

to keep in mind: If replacements are used, how quickly can you get reagents when you run out, and how long are reagents good? When working with equipment, you need to take into consideration the maintenance needs in order to ensure a properly functioning analyzer.

Finally, work with a supplier that will work with you by showing you how to properly use and maintain your testing supplies in order to yield the most accurate results. *wqp*

#### About the Author

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