Water Testing –
Selecting the Right Instrument

Those who run a professional swimming pool or spa know how important good and accurate testing of the water is. Those who own a domestic pool are keen to ensure it is kept fully functional and pristine clean.

Good measurement and control of the quality of the water are essential not only to the water's appearance. More importantly it plays an essential role in the consideration of bather comfort and safety. Regular and careful analysis also helps in the control of chemicals, keeping costs down, and the protection of the plant / pool and its equipment.

There are several options out there for water analysis equipment. First and foremost, none of the options is wrong. However, some are more appropriate to specific application. Therefore, before selecting which system to use and before embarking on the testing itself, it is important to consider the options available and select the method most suited to your needs.

At very least, the following considerations should be taken into account:

- The tests you need to carry out – which parameters are you looking to measure?
  At the lowest level, Chlorine (or Bromine for Spas), pH values and Alkalinity are typical.
  The more discerning analyst may wish to test for Balanced Water – Langelier Saturation-Index.
- The accuracy required to meet operating procedures.
  This is of particular importance for pools / spas utilized by the public.
- Do the results need to be recorded for potential audits?
- Where the tests will be carried out?
- Who will be doing the testing?

Once a response to these questions has been found, you will probably be faced with one of the two following alternatives: a visual comparator or an electronic photometer based system. Each method has its own respective advantages and disadvantages.

Comparators

Comparators are visual instruments that use a series of discs with continuous colour scales to take a measurement. By adding a chemical to the water (powder or tablet), a colour change is induced, enabling a visual match to be made and a reading taken. These easy-to-use colour match systems are economic, consistent and enable reliable testing. Typically, the systems are colour-stable, made of non-fade glass and ensure consistent results over many years without the need for recalibration. The simple nature of the system means there is little to fail and kits are always ready to use. Moreover, there are over 400 different test discs commercially available to read an extensive list from Alkalinity to Zinc.

However there are some disadvantages. The readings are, by their nature, subjective and can be affected by a number of external influences. Comparators should be used in natural daylight so

additional lighting systems may be needed. They rely on an individual's ability for colour matching - not everyone is competent or accurate (8% of males are said to suffer from some form of colour vision deficiency). Finally, although readings can be recorded, they must be noted by hand. There is no ability to print or store the results electronically.

Photometers

Photometers are electronic instruments designed to measure parameters via the colourmetric principle. The units give a direct, accurate digital reading of the test being carried out - clearly displayed on the screen. This removes any potential subjectivity being imposed on the reading. They are easy to use and can be operated in any lighting conditions. Most photometers can also be battery operated so still appropriate for in situ use.

Many photometers also enable the results to be transferred to either a printer or, alternatively, to a PC where they can naturally be stored for review or historic reporting. This is beneficial to any facility where water quality might be subjected to audits.

Being electronic, however, does mean the instruments do need to be well maintained, kept clean and regularly calibrated. Check Standards are now available to help verify the instrument's calibration. Unfortunately, poorly maintained photometers will still give results – however meaningless they are. Care should therefore be taken to ensure they are serviced regularly.

Whichever system you select, it is imperative that those carrying out the testing have the correct training, know how to use the equipment, understand the importance of water testing and remember the 3 R's:

Read – Record – React