

pH/EC/TDS/ORP in Pool & Spa

The importance of testing pH/EC/TDS/ORP in pool & spa.

Importance of Testing pH

The water's pH is a measure of its total acid-alkalinity balance -- the relative proportion of acids and alkalis in the water. Simply put, water that is either too acidic or too alkaline will cause an undesirable chemical reaction. On the pH scale, zero indicates extreme acidity, 14 will indicate extreme alkalinity and 7 indicates a neutral state. Most pool experts recommend a pool pH between 7.2 and 7.6. To raise or lower pH, simply add acids or alkalis into the water. If the water is too acidic, it will corrode metal equipment, cause etching on the surface materials and cause skin irritation. If the water is too alkaline, it can cause scaling on the pool surface and plumbing equipment and can cloud the water. Additionally, both high acidity and high alkalinity alters the effectiveness of chlorine. The chlorine won't destroy pathogens as well if the water is too alkaline, and it will dissipate much more quickly if the water is too acidic. As an example, by adding sodium carbonate or sodium bicarbonate you will generally raise the pH, and by adding muriatic acid or sodium bisulfate you will lower the pH.

Importance of Testing ORP

To understand the importance of ORP (Oxidation Reduction Potential) in pool and spa water, it is important to understand the effect of pH and the different types of chlorine compounds. By taking into account ORP, pH, and type of chlorine, one can determine the level of chlorine effectiveness. Free chlorine has two forms, HOCl and OCl⁻. HOCl is much more effective at killing organisms than OCl⁻ (it can be up to 250 times more effective). Combined chlorine is formed by the sanitizing action of the free chlorine reacting with organic matter, and a variety of other contaminants. It is important to maintain both the proper amount and the proper form of free chlorine in a pool to maintain the most effective sanitation possible. The primary variable in chlorine formation is pH. The ideal pH for swimming pools is 7.2 to 7.6, as this is the level that maintains the most chlorine as HOCl. ORP is an indication of the rate of this reaction between free chlorine and organic matter, i.e. it is measuring the oxidizing properties of the sanitizer (free chlorine) in the water. You must know the reaction that you are looking for and be aware of the degree by which ORP is pH dependent. ORP will not tell you the exact ppm levels of chlorine in the water you are testing. However, with the aid of this pH/ORP chart you will be able to tell which form the chlorine will be in and indicate the effectiveness of the sanitizer.

Importance of Testing EC/TDS

Total dissolved solids (TDS) are the measure of the total amount of dissolved materials in the water. The level of TDS in the pool is influenced by many factors. The chemicals we add to adjust the pH, chlorine, water hardness, alkalinity, dust, dirt, etc will all increase the level of TDS in your pool water. The maximum acceptable TDS level for non-salt chlorine generated swimming pools is considered to be 1,500 ppm. At values above this, you may begin to notice staining in the pool. It will also reduce the potency of any chemicals you add, preventing them from doing what they're designed to do. There is also strong possibility that the water may become cloudy.