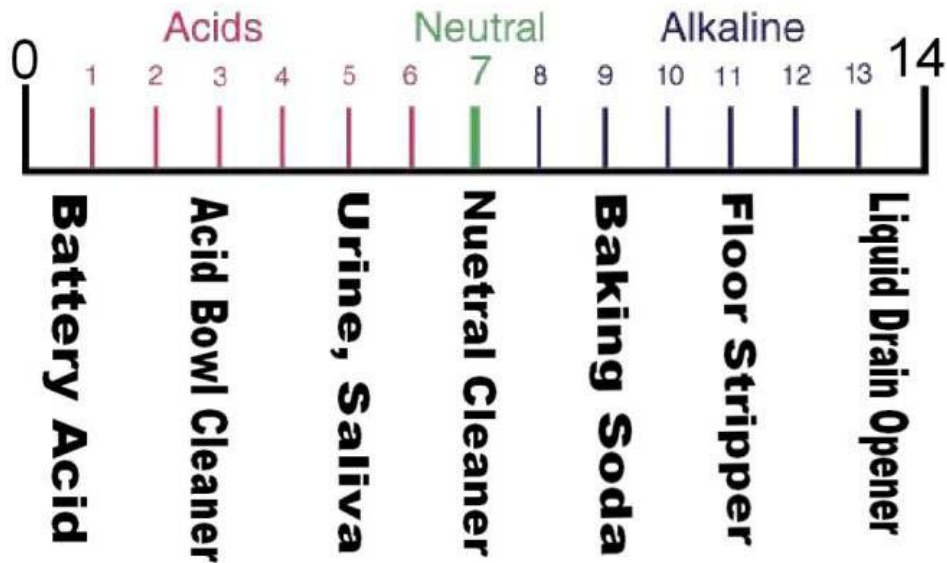


What is pH?

Electrically charged particles, or atoms, will be charged "positive" if they are hydrogen ions (acidic) or charged "negative" if they are hydroxide ions (alkaline). pH will measure the abundance of hydrogen ions over hydroxide ions (or vice versa) and to what degree the solution is acid or alkaline. If the ions, in a given solution, are equal in number then the solution would be neutral as shown below in the pH scale.



As you can see from the scale above, pH is measured in a range from 0 to 14, 0 being absolute for acid, and 14 being absolute for alkaline where seven indicates neutral solutions. Pure distilled water has a pH of 7.0.

Why is pH important?

When we talk about pH, we are really talking about whether a solution is acid or alkaline. If you have ever had acid-indigestion, then you already know why the proper pH balance is as important to your stomach as it is to a stripped clean floor ready for finish.

pH affects our lives in many ways: in the food we eat, for the proper soil to grow crops, and to keep the chemical balance in the swimming pool. We are all becoming more aware of "acid rain" (which is airborne pollutants affecting the pH of the rain) and how it impacts the environment. Marketers of skin care products constantly remind us of the importance of proper pH balance in our skin. For those who use cleaning chemicals, pH is a good indicator of a product's capabilities.

How is pH important?

Most soil is acidic in nature because it is a combination of dirt, dust and/or oily

substances. Neutralizing this type of soil with an alkaline cleaner is the best way to remove it. The degree of alkalinity required will depend on the soil's composition and buildup. Conversely, alkaline substances, such as lime, scale, rust, and hard water deposits require an acid product for cleaning. Generally speaking, the higher the pH, the more alkaline the cleaning solution and the more aggressive the cleaner is against soils which are acidic in nature. The same is not necessarily true for acid cleaners and alkaline soils because acids differ in degree of corrosiveness. There are many considerations other than pH when comparing cleaning products, such as total active ingredients, which usually tells you how far the product may be diluted; presence of solvents, because solvents do not have a pH; as well as surfactants, builders, etc. While pH will give you a good yardstick, it is by no means the only measurement.

What else should I know?

As previously mentioned solvents do not ionize in aqueous solutions and therefore do not have a pH measurement. Also pH does not measure the strength of acid based cleaners. Most acid cleaners have sufficient acid content to register a pH of less than one, however, due to their chemical properties even at low concentrations some acids, like sulfuric, are much more aggressive than others with higher concentrations, such as phosphoric. Remember, pH does not measure the corrosiveness of acid product. Alkaline cleaners, on the other hand, usually go through a four phase process of wetting, penetration, emulsification, and soil suspension to clean. Varying degrees of effectiveness in each of the four phases of cleaning often separate alkaline cleaners even further. For example, the standard butyl based degreaser has outstanding penetration properties as it reduces the viscosity of the oily part of soil, thus having excellent penetration abilities. The newer so called "non-butyl" degreasers have surfactant systems which make them excellent emulsifiers.

If you use pH to compare cleaning products, remember that there are other considerations as well. Total active ingredients (usually tells how far a compound may be diluted), surfactants, and builders are just a few of the other important features. While pH will give you a good yardstick for comparing chemical products, it is by no means the only or the best measurement. Limitations of pH measurements It is also important to understand that there are limitations to pH measurements. Most manufacturers express the pH of a product as a given number, which is fine as long as we understand that pH is a relative measurement and should be expressed in a range; i.e. neutral cleaner with a pH of 7.0-7.4. However, to keep things simple a single value for a product is usually specified.

There are four basic ways to measure pH. The most accurate method of measuring pH is with an electronic pH meter. In the field, pH papers are normally used to determine a solution's pH with fair accuracy. The other two methods of measuring are more indicators than actual measurements. They are: litmus paper and phenolphthalein. Litmus paper turns red in the presence of acid and blue in the presence of alkaline solutions. Phenolphthalein is a clear liquid that turns bright red or purple when alkalinity is present in a solution.

The pH Scale

Finally, the pH scale is a negative logarithm scale, which means that going from one pH unit to the next is a power of 10 in strength. This is especially important when understanding the strength of acid or alkaline compounds as they relate to the cleaning task. For example, a shift in pH from 8.0 to 9.0 increases the alkalinity 100 times from the neutral position of 7. A pH of 10 is 1,000 times more alkaline than a pH of 7.0, etc. Without this understanding of the pH scale you can be misled in the increasing power of a cleaning solution as the pH increases.

In Conclusion

Understanding pH is not difficult and can help you choose the right product for the task. Additionally, it can help you compare the strength or purpose of cleaning products as well as identify products which could be hazardous to the skin, eyes, etc. helping you to take the recommended proper precautions when using these chemicals.