



How Well Do You Know pH?

By [Doug Berjer](#)

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Almost 100 years ago, Dr. Søren Sørensen, a Danish biochemist, invented a measuring system that would become essential to proper carpet and upholstery cleaning - a system that measures whether something is acidic or alkaline, known today as the pH scale. Since then, the pH scale has been used to measure the acidity or alkalinity of countless substances ranging from foodstuffs and cosmetics to pharmaceuticals, cleaning chemicals and even soils. In fact, just about every liquid has had its pH measured at some time to determine how it will react to and with other substances.

For carpet and upholstery cleaning technicians, a thorough understanding of pH and how it can impact cleaning is critical. A chemical with a pH level that is too low or too high may not work satisfactorily depending on the type of soiling in question. Furthermore, chemicals with too low or too high of a pH - which are referred to as "reactive" - can damage fibers and cause severe burns.

The following is designed to help technicians better understand this critical topic.

The term pH stands for potential of hydrogen and measures what?

As referenced earlier, the pH scale ranges from 0 to 14 and measures the degree of acidity or alkalinity of a substance. In cleaning situations, it is often important to know the pH level of a soil or a cleaning chemical. The midpoint, 7, is neutral. To remember this, it is helpful to remember that pure water has a pH of 7. But here's where things get confusing. A pH of 7 or less indicates increased acidity while a pH of 7 or more indicates increased alkalinity. So the lower the pH value of a soil or chemical, the more acidic it is.

A pH of 4 is a "one-fold" increase over 3 and 3 is a "one-fold" increase over 2. Correct?

Wrong. One unit of pH in either direction is a 10-fold increase in the degree of acidity or alkalinity.

Citrus acid, which has a pH of approximately 2, was spilled on a customer's carpet and left a spot. To remove the spot, the technician should use an acidic cleaner.

No way. If removing a soil with a low pH (acidic), the technician must use a high pH (alkaline) cleaning solution. It takes an alkaline chemical to remove an acidic spot and vice versa.

Wool can only tolerate chemicals with low-level pH, while olefin and other synthetic fibers can withstand a high level of pH.

Yes and no. Wool is a protein, or a natural fiber, and can tolerate cleaning chemicals with mildly acidic pH levels. Olefin and many other synthetic fibers, on the other hand, can tolerate a higher pH. However, to be on the safe side, technicians should use a cleaner with a pH value closer to neutral. Strong pH levels in either direction can destroy fibers and negatively affect dyes.

Most cleaning chemicals are alkaline in nature.

Mostly true. Of course, there are some acidic cleaning chemicals and spotters, but because many of the soils technicians encounter are acidic in nature, most of the chemicals and spotters they use will have a neutral pH or somewhat higher. (See “The pH of Stains” below)

When dealing with an acidic spot that is difficult to remove, a chemical with a higher pH might be able to do the trick.

This may be correct, but to avoid harming fibers, a safer next step would be to give the cleaning solution more time to work, along with increasing both agitation and heat. The chemical may need to dwell on the spot for a longer amount of time, and agitation can loosen molecules to help dissolve them. And always remember, heat can improve the effectiveness of cleaning chemicals.

Inadvertently, a very high pH chemical was applied to clean a stain on a wool fiber. If the fiber is damaged, it will take several hours for the damage to become apparent.

Not true. In many cases, fiber damage - especially damage to the dyes in the fiber - will be noticeable in minutes. However, there are steps technicians can take to help minimize the damage if they move quickly. Applying a chemical with a mild pH to the problem area may neutralize any further damage to the fiber and the dye.

Understanding the pH levels of soils and chemicals can be complicated. But for carpet and upholstery cleaning technicians, that understanding is critical. It's what separates the professionals from the amateurs.

How to Test for pH Values

The MSDS sheet that accompanies all cleaning chemicals usually lists the pH value of the chemical. However, if that is not available, pH testing kits and test strips are available from a variety of sources. They can truly come in handy in situations where using a chemical with the appropriate pH level is critical.

When testing the pH of a liquid chemical, dip the pH strip into the chemical. If testing a dry chemical, mix the chemical with approximately two parts water. Leave the strip in the chemical for about 10 to 20 seconds, or as indicated by the manufacturer's instructions.

Next, compare the color of the strip to the corresponding color on the chart in the pH kit. This color will correspond to a number on the pH scale. For instance, if the test result color indicates a pH of 5, the chemical is mildly acidic.

The pH of Stains

Organic soils, such as food stains, are typically cleaned with an alkaline cleaner (pH 8+). These are often the most common stains encountered by cleaning professionals in residential settings.

Non-organic stains such as tar and grease typically require an acidic cleaner (pH 6 or less). These tend to be found more frequently in commercial facilities. However, they can be common in residential locations as well.

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Doug stated that Non-organic stains such as tar and grease typically require an acidic cleaner (pH 6 or less). Does this mean that when cleaning oily and greases restaurants that your cleaning product should be pH 6 or less and not alkaline.