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# Cleaning & Sanitizing Techniques

Written by Bob Peak



“They can make the difference between sound wine and spoiled wine.”

Daniel Pambianchi was talking about cleaning and sanitizing when he put that maxim in Techniques in Home Winemaking. Home winemakers take serious risks if they do not pay attention to these critical areas. Cleaning means to remove soil, grease, and other residues from the surface of utensils or equipment. That serves two beneficial purposes: It removes contaminants that might directly affect the quality of your wine, and it clears the surface for effective contact with a sanitizer. Sanitizers kill or inactivate any remaining microorganisms on the surface.

**Cleaning Products**

These are manufactured to help soften, dissolve, and lift off dirt, grease, and other contaminants. With a single exception (discussed later), all are intended to be rinsed off. To help with that, they are formulated for easy rinsing to avoid leaving material behind. Whatever you use, read the instructions on the package and observe safety guidelines. Common household cleaners like dishwashing detergent should be avoided in the winery. Those products are scented and the perfume may linger or leave a film or other residues when used on plastic containers, tanks, or hoses. Use a brush or scrubbing sponge to remove films. If you cannot reach a surface to scrub it, try soaking for several hours.

## **TDC Liquid Cleaner**

This product resembles dishwashing liquid, but differs in several respects. It is unscented so does not impart a perfume-like aroma. Marketed by National Chemicals, Inc. primarily to the bar and restaurant trade, it is a highly concentrated mixture of nonionic surfactants, glycolic acid, and other proprietary components. Surfactants, a word derived from surface-active agents, are large molecules that have one end soluble in water and the other end soluble in oil. When used in a water solution to clean a greasy surface, the oil-friendly end helps lift any film and the water-friendly end keeps it suspended in water to be rinsed away. The glycolic acid in TDC helps keep the pH low to assist in dissolving mineral residues and promote ease of rinsing. It is suitable for glass, plastic, and metal surfaces. Use rate is 1/4 oz. or 1/2 Tbsp. (4 to 7 mL) in 3–5 gallons (11–19 L) of clean water. Rinse thoroughly.

## **Sodium Percarbonate**

This simple mineral compound is a remarkably effective cleaner and oxygen bleach that is particularly effective at removing stains or color residues from equipment. It is a combination of sodium carbonate (soda ash) and hydrogen peroxide, which releases oxygen in the water, leaving just the soda ash residue to be rinsed away. Also known as sodium carbonate peroxihydrate, it is sold under brand names like ProxyClean and Proxycarb. The high pH provided by the carbonate helps remove greasy materials by a process of saponification where the fat is converted to a water-soluble soap and rinsed away.

Meanwhile, the hydrogen peroxide provides an oxygen bleaching action. The hydrogen peroxide is also antimicrobial and can kill organisms that may be on the surface. This is especially useful with porous materials such as wood or plastic. Use rate is from 1/8 to 1/2 oz. (3.5 to 14 g) per gallon (4 L) of water. Use cold or warm water. Do not use hot water as it tends to generate the oxygen too quickly and the bleaching action is lost. It has a high pH, so wear eye protection and consider rubber gloves for extended contact or high concentrations. Rinse thoroughly, apply a citric acid rinse, and rinse again.

## **PBW**

The initials stand for “Powdered Brewery Wash,” but do not let that stop you just because you are a winemaker. Straight A is another proprietary product with a similar formulation. These granular cleaners resemble sodium percarbonate in a number of ways and may include some of it in their formulas. PBW also contains the strongly alkaline compound sodium metasilicate but is buffered to make it safer in use and milder on materials. The formula also includes surfactants, so in some ways you

are getting the effects of a detergent like TDC and a cleaner like sodium percarbonate at the same time. It can be used in cold, warm, or hot water. It is considered particularly effective at removing protein residues. Use rate is about 3/4 to 2 oz. (21 to 56 g) per gallon (4 L) of water. As with percarbonate, use eye protection and consider gloves for extended contact. Rinse thoroughly, apply a citric acid rinse, and rinse again.

## **One Step No-Rinse Cleanser**

This is another white, granular proprietary product. It contains sodium percarbonate and sodium carbonate, which will provide an alkaline cleaning condition to remove oils and generate oxygen to disrupt proteins. It also contains sodium citrate to buffer the pH and make it safer to use, plus sodium chloride. As with the other brand name cleaners described earlier, its exact formula is a trade secret. The chief difference in One Step as compared with these other cleaners is in its “no rinse” instruction. I always prefer to clean and rinse winery equipment and utensils, then separately sanitize them with a certified no-rinse sanitizer. However, many users are satisfied that One Step can both clean and sanitize, saving some time and effort. On their website, One Step’s maker, Logic, Inc., notes that the peroxide action is highly antimicrobial and should adequately sanitize surfaces. It also notes that at the recommended use rate of 1 Tbsp (14 g) per gallon (4 L), the amount of residue is very small and consists of minerals likely already in the your tap water. They go on to note that it is not a certified sanitizer as designated by the U.S. Environmental Protection Agency (EPA), but advise that non-commercial users “probably don’t need a designated sanitizer.” So as a percarbonate-related cleaner, One Step is definitely in the running with the other products described above. As a no-rinse sanitizer, you will need to review the facts and come to your own conclusion.

## **Sanitizers**

### **Boiling**

Although effective, this technique is limited to objects that are small enough to fit in a pot and are sufficiently heat-resistant to be boiled. Boil at least 15 minutes. No need to rinse, just drain and allow to cool.

### **Sulfites**

I use sulfites in my wine to protect against oxidation and microbial spoilage. I use a 10% solution of potassium metabisulfite and add according to a guide like the one at [www.winemakermag.com/sulfitecalculator](http://www.winemakermag.com/sulfitecalculator). For sanitizing utensils and equipment with sulfite, Pambianchi recommends a 1% effective solution of sulfite, kept in contact with surfaces for 10 minutes. He notes that citric acid can be added to improve effectiveness. Because sulfite needs to be rinsed off before proceeding, it includes a small risk of re-contaminating the sanitized surface with non-sterile tap water.

## **Iodophor**

BTF and IO Star are brands of iodine-complex sanitizers. Using 1/2 oz. (14.5 mL) to 1 oz. (29 mL) in 5 gallons (19 L) of water provides active iodine at 12.5 to 25 ppm (mg/L). With a one- to two-minute contact time with clean surfaces, most organisms are effectively killed or disabled. For some applications, air drying is recommended. In many cases, you can just drain the sanitizer out and proceed. In my experience, a small amount of residue introduces no odor or flavor to my wine. Some users prefer to rinse when they have confidence that the rinse water is fresh and clean. The characteristic amber iodine color may stain soft plastic like vinyl hoses, but does not damage them otherwise. It is not recommended on elastomers. As the color of a batch fades over a period of a few days, you will need to add more iodophor or prepare a new batch.

## **Star San**

This sanitizer uses phosphoric acid and surfactants to kill microorganisms on clean surfaces. The surfactants in diluted sanitizer may leave foam or bubbles when it is poured out, but that small residue represents no significant risk to your wine. Use 1 oz. (29 mL) in 5 gallons (19 L) of water with a one- to two-minute contact time. As with iodophor, you may want to air dry, but a damp surface will not generally harm the wine in any way. Because of the strong acid, do not use on steel (other than stainless).

## **Chlorine Bleach**

My advice is never use it. While chlorine is effective at killing microbes, it has two serious deficits for use in a winery. First, the odor is so strong that it must be completely rinsed off to avoid off-odors in your wine. Second, and most important, chlorine is often a critical player in development of TCA contamination in wine. TCA, trichloroanisole, is the bad actor in “cork taint” odor of spoiled wine. Given the opportunity to interact with porous surfaces such as wood or cardboard, particularly if mold is present, it can contaminate an entire winery.

## **Citric Acid**

Although not an aggressive sanitizer, citric acid introduces a low pH and helps retard spoilage organisms. It is especially useful on porous surfaces like inside an oak barrel, where you should never use any kind of sanitizer (except steam or sulfite). Use percarbonate to clean a problem barrel and follow with a citric acid rinse. Use about 1 Tbsp. (14 g) per gallon (4 L) of water and rinse off after use.

## **Ethanol**

A 70% solution of ethanol is an effective, quick sanitizer. Since your wine will contain ethanol anyway, you can just spray a utensil, shake it off, and use it. Depending on where you live, you may find Everclear in your local liquor store at either 151 proof (75.5% ABV) or 190 proof (95% ABV). Dilute with distilled

water to 70% and store in a plastic pump spray bottle for quick use. No rinsing required.

## **The Winemaking Sequence**

### **Harvest and crush**

Grapes are not washed at harvest. All your winemaking equipment should be washed, but when to start sanitizing is a winemaker's decision. I wash my picking bins and my crusher/destemmer, but do not sanitize them. I do sanitize the food-grade plastic fermenters I crush the grapes into.

### **Fermenting**

Besides the fermenters, I wash my stainless-steel punch-down tool after each use. I sanitize it just before using it again, using my spray bottle of ethanol. Other winemakers I know keep a bucket of iodophor or Star San in the winery and either dip the punch-down tool before use or leave it in the sanitizer between uses. Although brief contact is not a problem, Star San may corrode stainless steel if left in contact with it.

### **Pressing**

After washing with percarbonate and rinsing off, I drench my press with a citric acid solution. After letting it stand for a few minutes, I rinse that off with clean water.

### **Bulk Aging**

TDC or percarbonate do a great job cleaning glass or plastic carboys and stainless steel tanks. Sanitize with iodophor or Star San. For oak barrels, simply rinse with hot water. If you suspect a problem with a barrel, use a soaking technique of up to 1 lb. (0.45 kg) of sodium percarbonate in a 60-gallon (227 L) barrel. Dissolve the percarbonate in a few gallons (~10 L) of water first and funnel into the barrel. Fill with clean water and soak several hours or overnight. Pour out, rinse, and then swirl a few gallons (~10 L) of citric acid solution to neutralize alkaline residue from the percarbonate. Rinse again, drain, and fill with wine.

### **Racking**

Clean and sanitize the hoses and receiving vessels with your products of choice. For pumps and hoses, prepare buckets full of cleaner, plain water, and sanitizer. Recirculate one after another for two minutes at a time.

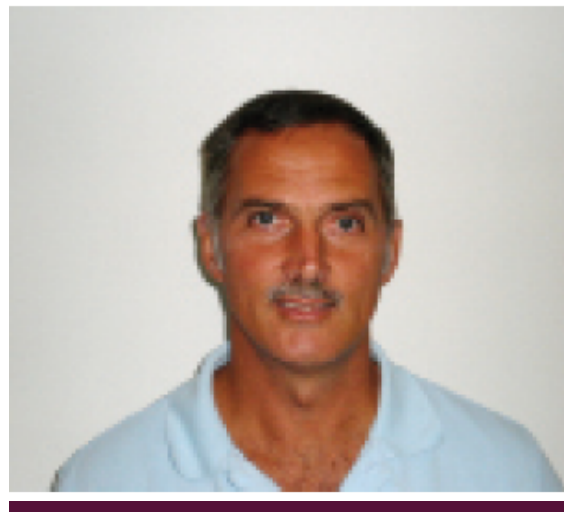
### **Bottling**

Spray the jaws of your corker with ethanol just before using. Wash and sanitize used bottles as you do carboys. I trust new bottles are sanitary as received and simply fill them. Always sanitize the racking cane or pump and hoses. Corks sealed in their original bags should be packed in sulfur dioxide gas and need not be sanitized. If the pack has been opened, dip corks a sulfite solution just before use.

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