

Commercial Winemaking Production Series

Chlorine Use in the Winery

Why not to use any chlorinated products anywhere in the winery

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Hypochlorite

Cleaning products that contain hypochlorite (OCl^-) should not be used anywhere near the winery, especially the production and hospitality areas, specifically the tasting room.

Formation of 2,4,6-trichloroanisole

Presence of chlorine is one of the two major contributors to the production of 2,4,6-trichloroanisole (TCA), the compound that causes a moldy, musty cork taint. TCA's sensory threshold is one of the lowest in nature at around 1 to 5 nanograms per liter. The second requirement for TCA formation is the presence of molds. They are common even in watertight caves and cellars due to frequent rinsing of tanks and floors and the desirably high relative humidity (80 percent or more) in barrel rooms, which minimizes evaporative losses of wine. Chlorinated and mold-methylated phenolics from materials such as wood or cork bark are known as chloroanisoles, and their equally potent bromine analogues are bromoanisoles.

Airborne TCA

Dirty floor drains in particular can become a potential source for TCA formation in the winery as they combine chlorine residues from rinses with the rich microbial activity needed for its formation.

If TCA is subsequently present in the cellar air, it can be introduced into the wine when barrels or tanks are emptied and refilled. The tiny amount of TCA that it takes to spoil a wine lot corresponds to equally small residues of chlorine from sanitizing operations. TCA is also easily absorbed by corks stored in the bottling line hopper and by open bags of bentonite or filter pads, so proper and separated storage of all processing aids is crucial.

Chlorinated cleaning products

Unfortunately, it is not always easy to immediately recognize that a product contains hypochlorite. Look closely at the ingredient list in dishwasher detergents (for tasting glasses), kitchen and bathroom cleaners, disinfecting wipes, and anti-allergen and sanitizing sprays. You also should watch out for fabrics and textiles that were treated with proprietary coating techniques that bind hypochlorite and prolong the presence of chlorine bleach. Because it is easily inactivated on contact with organic matter, chlorine often bleaches the dirt without removing it, while leaving a "clean" (only by association) smell behind.

Water quality

In addition to eliminating hypochlorite-based cleaning products, wineries should not use chlorinated municipal water for



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processing grapes or wine, such as when rehydrating yeast or malolactic bacteria or when rinsing destemmer-crushers, tanks, or hoses, etc. If there are no other options, the water must be pretreated with high-capacity, in-line carbon filters that are maintained on a very regular basis and exchanged frequently.

Chlorine dioxide

In recent years, chlorine dioxide (ClO₂) has been introduced to sterilize containers in the food industry. So far, research has been unable to determine if the use of ClO₂ could contribute traces of hypochlorite that are sufficient to produce troubling amounts of TCA in the winery.

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