



Cleaning winery floors, tanks and hoses

How clean does your winery have to be? Do you need to be able to eat off the floor? Will overly clean wineries prevent 'winery terroir', natural fermentations and only produce 'sterile' wines? The AWRI helpdesk is often asked about cleaning, sanitising and sterilising operations in the winery. This column, by **Geoff Cowey**, provides answers to some of the more common questions in this area.



Floors and walls of cellar areas should be rigorously cleaned at least twice per year to remove ingrained dirt, colour material and biofilms that will prevent the effectiveness of daily cleaning operations. It makes sense to do this once before vintage and again after vintage is complete.

What are the differences between cleaning, sanitation and sterilisation?

Cleaning is the removal of visible dirt, debris or unwanted material (solid or liquid) from a surface. This can include removing grape solids from the winery floor using a broom or removing colour or tartrate deposits from tanks after fermentation. Cleaning needs to be done before any sanitation steps to ensure that sanitisers make contact with the surface being sanitised. Typical cleaning agents include water (hot and cold), sodium or potassium hydroxide (caustics), carbonates or percarbonates, metasilicates, citric acid, and physical cleaning actions such as scrubbing, brushing or high-pressure spraying. There are also a range of proprietary blends which may include surfactants (detergents or wetting agents to lift dirt from surfaces) and sequestrants (metal chelating agents), which are important when using hard water.

Sanitation is the reduction of the microorganism load on a surface to a level that minimises microbial spoilage

potential. Wineries define sanitation as a 3 log or 99.9% decrease in cell number. Typical winery sanitisers used in Australia include hydrogen peroxide and peroxyacetic acid (peracetic), sulfur dioxide, alcohol solutions, hot water and/or steam. Detergents and surface spray cleaning agents are typically made of a range of chlorine-based agents often with added artificial flavours (citrus/lavender). These can be used in office and laboratory spaces but should be avoided on winery tanks, floors, barrels and packaging lines to prevent chlorophenol, chloroanisole and artificial flavour taints.

Sterilisation is the complete removal or inactivation of all living microorganisms present. Sterilisation is achieved by maintaining high temperatures for a fixed period of time (dry heat or flaming, heating under pressure and/or hot water or steam), by physical removal of microorganisms through absolute membrane filtration, or using chemical treatments like dimethyl dicarbonate to inactivate or kill all living organisms. Verification testing is required after sterilisation to determine if the treatment has been successful.

What needs to be cleaned, sanitised or sterilised in a winery?

Floors, walls, ceilings, drains, fermenters, tanks, barrels, hoses, hoppers, crushers, presses, fittings and fixtures, buckets, plungers, sampling devices and anything that makes contact with wine should be cleaned before and/or after use. Sanitation is typically performed before use. Sterilisation steps are generally reserved for bottling operations.

Floors walls and ceilings

Floors and walls of cellar areas should be rigorously cleaned at least twice per year, to remove ingrained dirt, colour material and biofilms that will prevent the effectiveness of daily cleaning operations. It makes sense to do this once before vintage commences and again once vintage is complete. This also applies to crushers, hoppers, some presses, pumps and winery grape bins. Any full tanks of wine should be sealed or moved before any cleaning commences in the area.

Floors can be washed and scrubbed (with scrubbing brushes/brooms) using cold then hot water or using cold water with



a high-pressure cleaner. High-pressure cleaning nozzles can aid in cleaning floors and winery machinery. Use on walls will depend on their composition. Water used for cleaning should ideally be potable water to prevent scale residue. Non-potable water can be used for daily cleaning of floors to wash away grape and wine sediment. To conserve water, a variety of stiff brooms, rubber brooms and squeegees are available to direct solid wastes to drains/sewer traps. Preventing gross solids from entering the winery drainage systems will also reduce the chance of off-odours building up in the waste lines. Gross solids can be collected with grape marc.

Tanks

The internal surfaces of winery stainless steel tanks generally require cleaning after fermentation, settling, fining and stabilisation cellar operations. Both fermentation and cold stabilisation will result in a significant 'tartrate' coating of tank walls, as well as red pigment staining from red wines. Vertical stainless-steel tanks are often cleaned with caustic or

other basic solutions, citric, peroxides and hot water. The process can be aided with manual scrubbing for small tanks or with spray balls or rotary cleaning spray heads. Appropriate safety clothing and glasses/goggles should be worn during these cleaning operations.

When cleaning tanks, it is recommended to remove all rubber o-rings from doors or fittings and clean these by hand. Sample valves, taps and gauges should also be opened and closed during the operations to ensure the cleaning solution makes contact with all tank surface area. Black moulds on the outside surface of tanks can only be removed by regular manual scrubbing.

Hoses and fittings

Hoses are cleaned after use by first flushing with water to remove any residual wine. Hoses can be cleaned while cleaning a tank, using a pump with two hoses to move the caustic or citric liquid from the bottom of the tank to the top spray ball. Hoses can also be cleaned separately. One hose is connected to a pump inlet and one to an outlet. Both

hose ends are then placed in a 200L tub filled with a 0.5-1.0% caustic solution and circulated with the liquid for five minutes. The caustic is emptied from the lines and then the inlet placed in an equivalent tub of 5% citric acid. A tub of caustic and citric can be placed on a pallet or mobile unit that can be moved to where cleaning needs to take place. Solutions should be remade once they become discoloured or diluted. The lines are then rinsed with water. Cleaned hoses should ideally be placed off the ground to hand dry rather than coiled and left on the ground. This way hoses can be used immediately when needed rather than repeating the process again before use. Similarly, cleaned fittings can be placed on a designated equipment rack to aid in finding equipment easily and to know the materials have been cleaned.

For more information about cleanliness in the winery or any other grapegrowing or winemaking technical matter, please contact the AWRI helpdesk on helpdesk@awri.com.au or 08 8 313 6600.

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