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TECHNICAL ARTICLE

Central Membrane Air Bag: The Press Choice for Winemakers

Quality conscious winemakers worldwide are enthusiastically adopting Della Toffola's latest membrane press technology innovation to achieve:

- Cleaner Juice
- Less Phenolics
- Less Browning
- Better Yields
- Shorter Pressing Cycles

Della Toffola knows what every winemaker knows: oxidation is bad for wine quality. For white wine the main culprits are oxidases, those nasty little enzymes lurking in grape skins. As long as they are locked away in healthy, intact berries, they can't cause harm. But as soon as they break out, they run amok, catalyzing oxidative reactions which spoil fruit flavour and ruin juice and wine colour. The longer they keep at it, the more damage they do.

You can try to limit the damage oxidases do by minimizing the availability of oxygen molecules for them to hijack. By using inert gas covers, for example. But as long as they are still in the juice, they'll cause mischief whenever they get a chance, whenever they find some oxygen.

Even with careful use of inert gas, more oxygen inevitably sneaks in somewhere. During racking, and even through tiny leaks in hoses and fittings, for examples. That's why smart winemakers try to separate juice from the skins with the least possible damage to the skins, and as quickly as possible. Prevention is better than cure.

For at least twenty years membrane 'air bag' presses have been the pressing technology of choice for making quality white wine. No other type of press yields quality pressings as efficiently. This is because membrane presses separate juice relatively quickly, and they are gentle on the skins, minimizing the disruption which lets the oxidases loose.

But the standard side mounted membrane press has an important limitation: the configuration of the screen which holds back the skins while allowing juice to pass through.



When the membrane is fixed to the side, only about half of the tank surface can be used for the screen.

To improve on the performance of side mounted membrane presses, Della Toffola took inspiration from the traditional Champagne press technology, which is still used since its inception hundreds of years ago. This made sense, because avoiding oxidation and browning is especially critical for Champagne base wine production.

The traditional Champagne press is a vertical basket press with a cylindrical screen comprised of upright oak staves. Gentle downward pressure on the charge of grapes expels juice through the spaces between the staves, with minimum damage to the skins, resulting in minimum oxidases in the juice. It gives Champagne quality juice, but it's cumbersome and slow to discharge the pressed skins and recharge with grapes, though. An acceptable inefficiency only if you can achieve Champagne prices.

Della Toffola's latest innovation provides a step up in wine quality as well as pressing efficiency by borrowing the champenoise concept of a continuous cylindrical screen, and applying it to the enhanced efficiency of a membrane press.

The result is an air bag press with a central membrane. With its membrane positioned centrally, the whole cylindrical surface of a Della Toffola press is available for the screen (except for the small area taken up by the doors, of course.)

This effectively doubles the screen surface area relative to the volume of the charge, enabling not just quicker separation and a greater fraction of clean free-run juice. It also enables quicker expression of the remaining juice, under more gentle pressure from the inflating membrane, and with less cake-breaking phases required.

The results are, in comparison with standard side mounted membrane presses, less damage to skins during pressing, and so lower polyphenol levels and fewer solids in suspension. In other words, lower concentrations of oxidases, and so less oxidation, better retention of flavour, and less browning. And because there are fewer suspended solids, quicker cold settling.

But wait, there's more! Because it all happens more quickly, shorter press cycle times mean increased pressing productivity, especially important during the peak of harvest. And less skin contact times mean that the oxidases which are still bound to the skins have less time to do their dirty work, so there is less oxidation in the press itself.

"We have been extremely satisfied with the performance of our Della Toffola central membrane air bag presses. We can crush and achieve drainage at 100 tonnes per hour in feed and then press in 90 minutes, achieving further downstream benefits such as faster settling and quicker reaction time and utilisation of centrifuges, tanks and staff as well as lower solids and lower phenolics, which means faster clarification and less wine downgrades due to reprocessing," said James Vardanega, Cellar Operations Manager for Casella Wines.



“The central membrane press efficiency, ease of operation and cleaning, automation, and capacity to setup for different varieties and cycles as required, has given us competitive advantages and an excellent return on our investment,” added Vardanega.

Rob Godwin from GisVin Ltd in Gisborne, New Zealand, is another satisfied Della Toffola customer.

“Regarding our PFC200 Della Toffola purchased and installed for the 2009 vintage, I can personally say that the press met our expectations,” he said.

After comparing the Della Toffola to his side mounted membrane presses, Rob made the following specific observations:

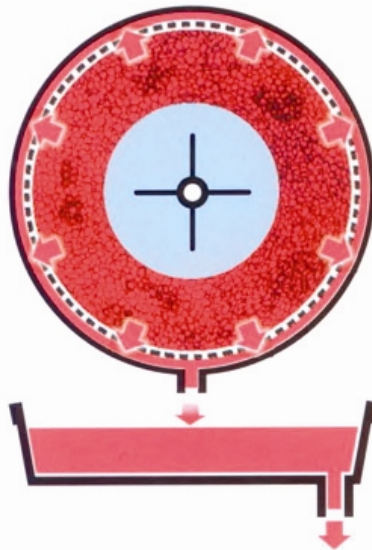
- Increased volumes of free run juice prior to beginning the press cycle and less colour pick up in certain varieties (e.g. Pinot Gris);
- Juice quality was good and solids levels were within satisfactory levels (or maybe better once we have collated information);
- Simple to use and read interface; altering programmes to suit varieties/customer specification is easy and fast;
- All safety measures reliable, i.e. overfill/ bag damage prevention, door sensors and emergency stops;
- Shorter press cycle times (maybe half of side bag press) enabled maximum use of press during peak of harvest.

Della Toffola is exclusively distributed by Australian & New Zealand Winemakers P/L. For further information, call (03)9924-4060 or visit www.ausnzwinemakers.com

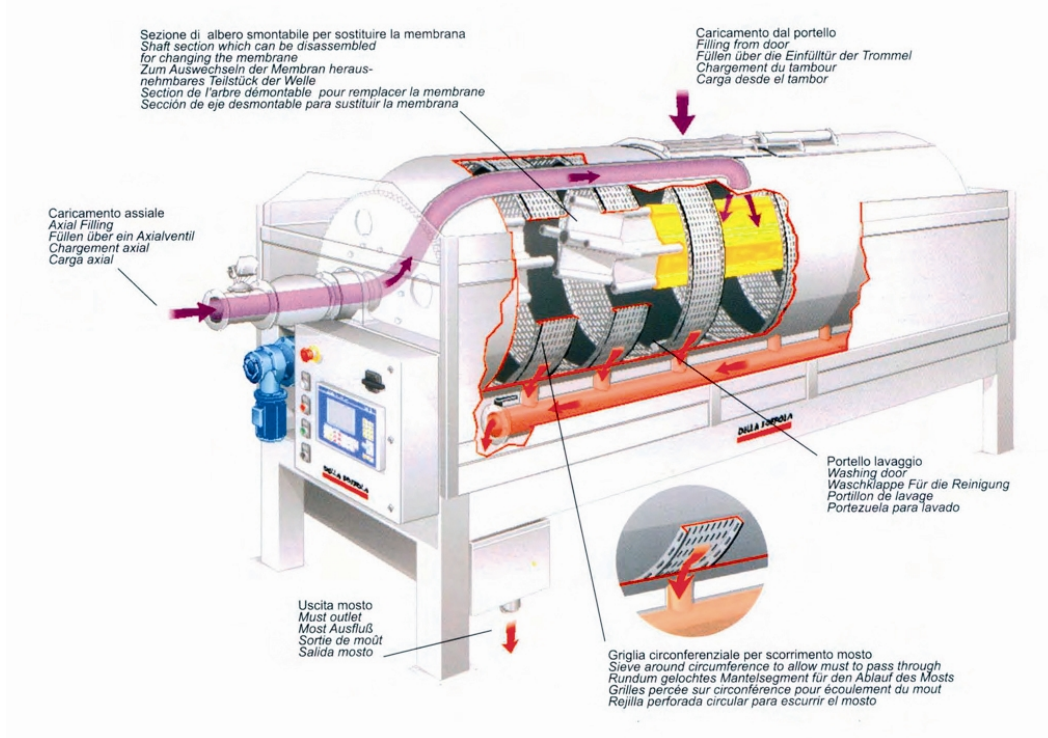
This article first appeared in Australian and New Zealand Grapegrower & Winemaker magazine in June 2009.



The Della Toffola Central Membrane Air Bag Press



The membrane is mounted on the drum axis and presses on its entire inside surface when inflated



Technical drawing of the Central Membrane Air Bag Press