

# EFFECT OF PROCORK BARRIER MEMBRANE ON 2,4,6 –TRICHLOROANISOLE EXTRACTION FROM WINE CORK

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## 1. ProCork Background

### ProCork – What is it?

- ProCork is a new generation of closures
- Natural cork sealed with a membrane barrier
- The membrane has layers which regulate water, oxygen and taint transmission, and flavour scalping

### What are the benefits of using ProCork?

- Reduces random variation due to cork taint and oxidation
- Minimises flavour modification and allows true bottle derived wine character

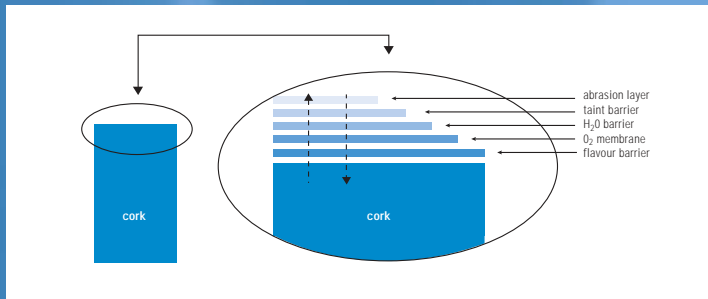


Figure 1: Layers of ProCork Membrane

## 2. Introduction

Natural and 1+1 corks, pre-contaminated by Centro Technologico Da Cortica (CTCOR) with a consistent quantity of 2,4,6-Trichloroanisole (TCA), were coated with ProCork membrane and bottled. The wine was then analysed over time to determine the level of TCA contamination.

## 3. Materials and Methods

The ProCork barrier membrane was applied to corks and coated with paraffin wax (0.01g/cork) and CAF (0.002g/cork) and vacuum bottled<sup>1</sup> on 24th June 2003. The bottles were allowed to stand upright for 2 weeks prior to inverted storage on 8th July 2003.

### Chemical Analysis

The wine samples were sent to AWRI and Vinpac International for chemical analysis by GC/MS using SPME<sup>2</sup>. Deuterated-TCA (dTCA) was used as the internal standard.

For each bottled wine sample, the cork used to seal the wine was analysed for TCA.

The cork was soaked in model wine solution (AWRI – 100mL 12% ethanol, Vinpac International – 90mL 10% ethanol) for 24 hours to allow the extractable TCA equilibrium to be achieved.

### Volume Adjustment

To accelerate the observation of TCA contamination in the bottled wine, the bottles were filled to only 300ml. Consequently, the volume was adjusted to 750ml to calculate the transmission rate.

## 4. Results

A summary of the results of 3, 8, and 12 month storage is presented in Figure 2. The data compares the quantity of TCA in the bottled wine under a ProCork membrane cork against the same cork that has been soaked in model wine for 24 hours.

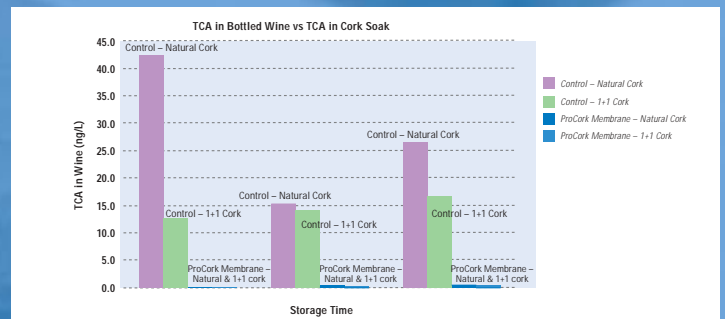


Figure 2: Bottle Performance of ProCork Membrane Cork 12 months (Adjusted storage volume)

The wines sealed with ProCork barrier membrane had mean TCA levels below the detectable limit (<1ng/l) and in half of the cases, no TCA was detected. The mean TCA levels over 12 months ranged between 0.08ng/l to 0.48ng/l, whilst the control had equilibrium TCA mean levels between 14.4ng/l to 42.4ng/l. This indicates that the ProCork membrane after 12 months on average reduced the TCA in the bottle by 97.9% when compared to the equilibrium TCA.

## 5. Conclusion

The use of ProCork membrane on contaminated corks have reduced the level of TCA contamination by 97.9% on average. This resulted in wines that on average had TCA at below perceptible levels.

<sup>1</sup>Godden, P., Francis, L., Field, J., Gishen, M., Coulter, A., Valente, P., HΔj, P., Robinson, E. (2001) Wine bottle closures: physical characteristics and effect on composition and sensory properties of a Semillon wine. Australian Journal of Graph and Wine Research 7, 64-105.  
<sup>2</sup>Evans, J.T., et al., (1997) Analysis of 2,4,6-trichloroanisole in wines using solid phase microextraction coupled to gas chromatography-mass spectrometry. Journal of Chromatography A, 786: p. 293-298

Disclaimer: Any product performance indicated by ProCork is based on trial data obtained under particular bottling, wine preparation and transport/storage conditions for particular cork samples. The recipient is advised to conduct their own trial to determine the optimum effectiveness of the product for their own unique circumstances.

