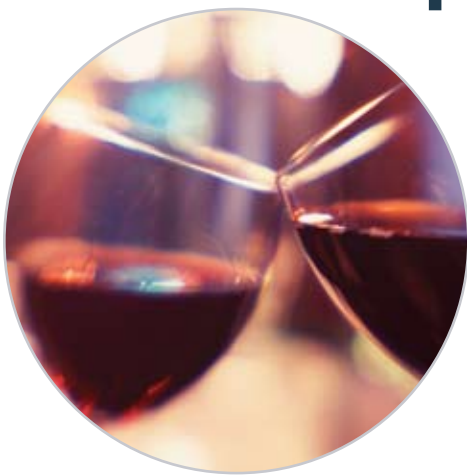




# WINE TESTING REPORT



Scholle   
**d2b**<sup>TM</sup>  
integrated packaging logistics



### Closing the Global Distribution Gap

The use of Flexitanks to transport bulk liquid cargo has been a shipping option for the past two decades. Pioneered by logistics service providers, this package has continued to grow in popularity, attributed to the increase in global competition, need to improve supply chain costs and technology improvement.

Scholle Packaging is the inventor of flexible liquid BIB (bag-in-box) systems, and has achieved global leadership in the manufacture and supply of these products and systems to industries for over five decades. Many of the innovations in the BIB liquid packaging and Flexitank market, now widely accepted as industry standards, were conceived and introduced by Scholle. Much of our development effort over time has been focused on innovation related to food and beverage packaging.

Scholle's investment in an in-house team of dedicated polymer scientists generates continuous innovation and development across our product ranges, and we now introduce the next generation in Flexitank liquid packaging technology to our customers.

The Scholle Flexitank offers a three-fold barrier improvement over what is currently available in the single-ply Flexitank product market. The primary material used in manufacture of this product is a single layer 1000µm (micron) three-layer coextruded film, incorporating integrated proprietary barrier technology.



### Project Overview

A shipment of 8 containers, each containing 24,000L of wine was dispatched from Australia to the United States. Container and wine temperatures were monitored throughout the logistics cycle. Then, pre- and post-delivery samples were analysed to determine quality change in transit.

**Flexitank Construction:** Single-ply Flexitank available in a range of sizes from 17,000L to 24,000L. Fitments are 2" or 3" bottom discharge.

**Barrier Film Specification:** Three layer, co-extruded, 1000 micron in thickness. The centre film layer has FDA-compliant proprietary resin formulation to provide superior barrier properties. Benefits include dramatic reduction in gas transfer and significant lowering of risks associated with taint-causing complex organic compounds.

Scholle A2B's premium barrier Flexitank has undergone rigorous internal trials, including full material assessment, manufacturing and conversion trials, loading and unloading testing and live load transcontinental logistics supply chain evaluation and testing. We offer this Flexitank as a fully-qualified product.

Scholle's assessment of the new premium barrier Flexitank was made with wine products. The highly oxygen-sensitive nature of wine lends itself well to measurement and evaluation of product quality change in transit. In addition, well-established intercontinental wine trade and laboratory facilities at both product origin and destination facilities allowed for convenient data analysis. The results reported below may be considered indicative for most oxygen sensitive products transported in Scholle premium barrier Flexitanks.



### Our Mission

Scholle Packaging's mission is to provide safe, efficient, convenient and functional packaging solutions through continuous innovation, cost-effective manufacturing and sustained industry dedication.

### Our Value Proposition

Using Scholle A2B™ bulk logistics services is the best product quality guarantee available to your business in the Flexitank logistics industry. Our leading packaging innovations provide the best product protection available in the market right now, at competitive prices. Scholle's ongoing technology commitment in Flexitank development will continue to deliver industry-leading technology and innovation to our customers into the future.

Talk to a Scholle A2B representative today about cost-effective bulk shipping solutions that guarantee minimal quality impact in transit.



### MARKETS SERVED

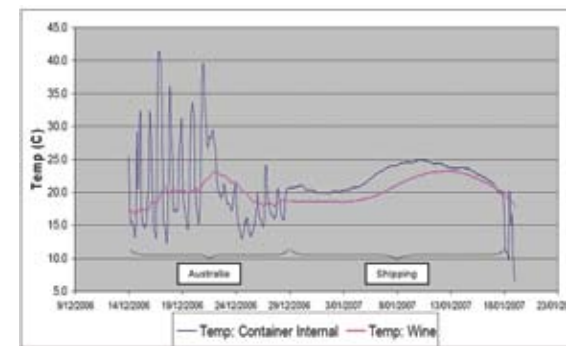
- |                 |                 |
|-----------------|-----------------|
| BASE OIL        | NATURAL LATEX   |
| CHEMICALS       | PALM OIL        |
| COCONUT OIL     | PARAFFIN WAX    |
| CORN SWEETENER  | PHARMACEUTICALS |
| CORN SYRUP      | PLASTICISERS    |
| DETERGENTS      | POTABLE WATER   |
| DRILLING FLUIDS | PRINTING INK    |
| EDIBLE OILS     | SORBITOL        |
| EMULSIONS       | SYNTHETIC LATEX |
| FRUCTOSE        | TALLOW          |
| FRUIT JUICE     | TRANSFORMER OIL |
| CONCENTRATE     | VEGETABLE PASTE |
| GLYCERIN        | WAXES           |
| LIQUID SUGAR    | WHITE OIL       |
| LUBRICANTS      | WINE            |
| MALT EXTRACTS   |                 |

Please consult a knowledgeable Scholle A2B representative about any product you plan to ship via Flexitank.

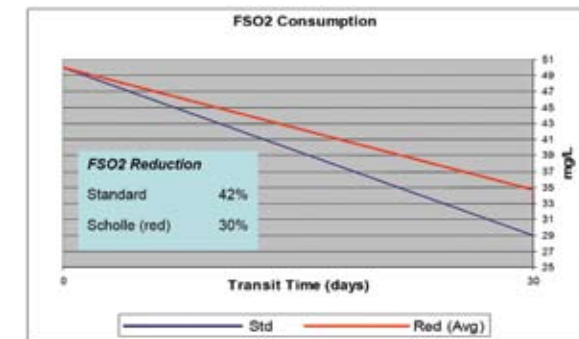
### Key Data Points

- 8 x 20' FCL: 24,000L per container
- 5 containers of Chardonnay
- 3 containers of Cabernet Sauvignon
- 2 x "Control" Flexitanks (LDPE and LDPE + EVOH outer sleeve)
- Shipped from South Australia; destination USA
- Transit time: Approximately 30 days
- Environmental: mid-summer South Australia: ambient temps up to 42°C  
mid-winter United States: ambient temps down to 7°C

### Testing Results



The above graph represents the combined data from container airspace and immersion loggers. The steady curve shown for the shipping portion of the journey indicates the passage of the sailing vessel through the tropics.



Indicative FSO2 consumption over a 30 day transit. The use of external EVOH sleeves return highly-variable oxygen barrier performance, according to atmospheric moisture content, integrity of sleeve and fitting methods. Measured performance compared to the Scholle Flexitank varies between 10-50% in performance penalty, dependent upon specific conditions. Please discuss with a Scholle representative in more detail.

## Results and Analysis

Laboratory tests conducted on the two shipped wines pre- and post-delivery using Scholle's premium barrier Flexitanks yielded the following results:

<b>CHARDONNAY</b>	Pre-Delivery	Post-Delivery
Alcohol	13.48%(v/v)	13.50%(v/v)
Total Acid	6.19g/L	6.02g/L
Volatile Acid	0.43g/L	0.44g/L
TSO2	178.00mg/L	179.67mg/L
FSO2	50.00mg/L	34.00mg/L
520	0.01nm	0.01nm
420	0.11nm	0.10nm
Intensity	0.12AU	0.11AU
Hue	0.10	0.09
pH	3.46	3.44
Dissolved Oxygen	0.62mg/L	0.95mg/L

<b>CABERNET SAUVIGNON</b>	Pre-Delivery	Post-Delivery
Alcohol	13.73%(v/v)	13.76%(v/v)
Total Acid	6.01g/L	5.95g/L
Volatile Acid	0.40g/L	0.40g/L
TSO2	127.33mg/L	130.00mg/L
FSO2	50.00mg/L	36.67mg/L
520	1.25nm	1.25nm
420	0.89nm	0.90nm
Intensity	2.17AU	2.15AU
Hue	1.40	1.39
pH	3.58	3.55
Dissolved Oxygen	0.44mg/L	0.58mg/L

General consensus from a five-person winemaker taste panel revealed an inability to differentiate between pre- and post-delivery samples. Both sets of samples displayed similar sensory characteristics with respect to flavours, colour, bouquet etc.

## Summary and Conclusions

Overall, the benefits associated with using the Scholle premium Flexitank include:

- Superior product protection in transit
- More cost-effective packing at destination
- Longer shelf-life in the retail supply chain
- Better quality at any time point within the supply chain
- Reduction in retail returns through product expiry or customer quality-related complaints

A premium barrier Flexitank was developed by Scholle Packaging in response to the increasingly global transcontinental movement of bulk liquids which demands efficient supply chain logistics and superior product protection and quality.

The next generation in technology development for Scholle's premium barrier Flexitank offering is already well underway, with a promise of similar magnitudes of improvement over those already achieved. Alignment with Scholle A2B as a full service provider presents your organisation with a strategy to ensure the quality of your products today and well into the future.



Printed on 30% post-consumer waste, recycled paper, and manufactured with renewable wind-generated electricity.

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