

**WINE PACKAGING:  
ALTERNATIVES TO TRADITIONAL GLASS**

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**Dissertation submitted in partial fulfillment for the Cape Wine Master Diploma**

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**DECLARATION**

“I, Lyn Jessica Woodward declare that this dissertation is my own, unaided work. It is submitted in partial fulfillment of the requirements for the diploma of Cape Wine Master to the Cape Wine Academy. It has not been submitted before for qualification of examination in this or any other educational organization”

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Signed

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Date

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## **ABSTRACT**

Packaging wine involves the science, art and technology of bottling, enclosing or protecting products in the best medium for distribution, storage, presentation of goods for sale, and consumption.

The majority of wine produced and sold globally is packaged in glass. Traditionally glass is an excellent medium that serves the practical, aesthetic and quality protection requirements of a bottle of wine well. In recent years however, wine retailers have become progressively more conscious of environmental issues. This is driven primarily by legislation, and more recently by significant consumer awareness.

The terms “carbon footprint”, “environmental impact” and “sustainable practice” are now well known and understood by the consumer and have a direct and increasingly important influence on the purchasing decision. Consequently wine producers are obliged first and foremost to act within their legal obligations and legislation, and then consider the best possible production and packaging choices for minimal environmental impact to be successful in the South African and international markets.

This report studies and summarises the packaging options available to the wine industry, including the positives and negatives of traditional glass and alternative media. It is based on a review of available research, literature and reports and on the opinions of local and international industry stakeholders.

The report will further note technological advancements, including international packaging trends. Since over half of South Africa’s wine production is exported, with the UK receiving the most significant volumes, the demands and trading requirements of the UK wine market are included in this report. The report will confine itself to packaging trends of natural still wines and sparkling wines.

Currently, glass remains the preferred packaging choice for wine. In the future producers will make use of alternatives such as polyethylene terephthalate, Tetra Pak cartons, aluminium cans, bag-in-box and pouches to fulfill increasing legal and environmental pressures whilst still providing the most effective means of protecting the quality and aesthetic appeal of their wine, and ultimately, remaining globally competitive.

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## LIST OF ACRONYMS AND/ DEFINITIONS

**AP:** refers to 'alternative packaging'

**BIB:** Bag-in-Box

**Carbon footprint :** “the total set of GHG emissions caused directly and indirectly by an individual, organization, event or producer” (UK Carbon Trust 2008) “For simplicity of reporting, it is often expressed in terms of the amount of carbon dioxide, or its equivalent of other GHGs, emitted.” (wikipedia 2009)

**CO<sub>2</sub> emissions:** Carbon dioxide discharge/ production

**Carbon neutral:** business/household having net zero carbon emissions, achieved by offsetting CO<sub>2</sub> emissions by e.g. planting trees

**EVOH:** Ethyl Vinyl Alcohol

**GHG: greenhouse gas:** gases in the earth's atmosphere that absorb and emit radiation

**LCA:** Life Cycle Assessment: Analysis and valuation of the environmental impact of a product or service.

**LDPE:** low-density polyethylene

**PET:** polyethylene terephthalate

**Recyclable:** adjective of 'Recycling' – see below. In this report, recyclable refers to the capacity of a specific packaging material to be recycled.

**Recycling:** “A series of activities that includes collecting renewable materials that would otherwise be considered waste, sorting and processing them into raw materials, and manufacturing these into new products.” (Glass Recycling Company)

**Re-use:** “to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles” (Act No. 59, 2008 National Environmental Management: Waste Act, 2008)

**Sustainable development:** pertains to finding the balance between economic, social and environmental demands.

**WIETA:** Wine Industry Ethical Trade Association

**WRAP:** Waste and Resources Action Programme, aids individuals, businesses and local authorities to reduce waste and recycle more, making better use of resources and helping to tackle climate change

# **PART I**

## CHAPTER 1 INTRODUCTION

*“Let every individual and institution now think and act as a responsible trustee of earth, seeking choices in ecology, economics and ethics that will provide a sustainable future, eliminate pollution, poverty and violence, awaken the wonder of life and foster peaceful progress in the human adventure.”*

John Mc Connell, founder of International Earth Day

Twenty years ago few would have imagined getting their daily milk delivery in anything other than glass bottles delivered by the local milk man. Yet nowadays, milk is packaged in bladder packs, PET bottles and cartons amongst others, and bottled milk is a rarity. This basic illustration shows that tremendous advances have been made in packaging methods over recent years, which have spilled over into the wine industry.

Packaging is one of the most important factors contributing to the commercial success of a product or brand. Considerations in packaging choice include product protection, functionality, quality and aesthetic appeal.

### **Packaging as seen from an environmental perspective**

Leading wine commentator and wine producer, Robert Joseph, speaking at Vinexpo 2009, believes that there will be a global standard of sustainability in the wine industry within the next five years and that a wine producer, no matter how large or small will need to conform to certain levels of sustainable practice or risk their long-term viability. (Mustacich, S. 2009)

American wine commentator and author, Eric Arnold, quoted a study by the American Association of Wine Economists in *Forbes* magazine that the production and distribution of wine was responsible for nearly 1% of total global greenhouse gas emissions annually - that is over six billion tons. (Kalkowski, J. 2008)

Increasingly, environmental considerations appear to be a factor in packaging choice, as environmental consciousness becomes a larger issue of public debate and discourse. Consequently, retailers and consumers alike are set to become ever more conscious of terms like “carbon footprint”, “environmental impact” and “sustainable practice”.

Wine producers will no doubt become obliged to not only embrace these trends in terms of production but also in the specific packaging methods they choose. Gordon Grant, managing director of Palandri wines in Western Australia notes: “We’re getting a lot of requests for eco-friendly packaging that are either totally recyclable or which have a small footprint.” (Carter, F. 2006)

Consumer perceptions are crucial in how a product is accepted into the market place, and the introduction of new packaging formats is notoriously difficult to achieve successfully. Nick Zema, chairman of the Coonawarra Vigneron’s Association in Australia, says that image plays a pivotal role in wine and packaging choices; “I think we need packaging that substantiates that.” (ABC 2006)

Lifestyle choices play a large role in this process; eg: wine in non-glass packaging is available at outdoor events, such as concerts, sporting events etc. Size has also influenced wine’s accessibility; instead of having to purchase a 750ml bottle of wine, smaller units are available including single-serves which redefine how and when consumers drink wine.

The South African wine industry spends roughly R4 billion annually on packaging. Very few companies recognize the impact that packaging decisions have on the overall impact of the bottom line and of the opportunities that exist by considering the choices available. (Carter, M. 2009)

## **1.1 Scope and contribution of the report**

The developments in packaging during the past five years have been tremendous, and have run parallel with the “green” movement – and sometimes at odds with it. Producers are not only motivated by the need to address environmental consciousness but also to widen the target market for their product.

The main objective of this report is to review wine packaging options to South African producers, for possible use in the local and international markets. It will explain the current usage of packaging methods and trends.

This assignment will summarise recent developments in this field and will provide some examples, local and/or international, of AP (alternative packaging).

The main focus of this assignment is to highlight more environmentally friendly wine packaging, in terms of recyclability and reduction of carbon emissions, with the aim for wine producers to consider reducing their carbon footprint, especially in regard to the packaging and, where applicable, logistics of transporting their wines to local and international markets.

This report will not focus on the technical production methods of each AP, unless pertinent to its function. It will rather provide insight into what is available and what are the advantages and disadvantages of each AP.

There is relatively little published data and analysis of wine packaging in the South African market. A key objective is to summarise the available published data. A survey was conducted amongst selected producers and retailers and this provides views from knowledgeable professionals.

However, there is more published data available internationally. As AP is still in its infancy in South Africa, the international data will be incorporated into this report, together with literature and information from wine packaging suppliers.

## **Outline of the document**

The report is divided into three sections:

Part 1: Provides a general overview of packaging and its importance in the wine industry. It provides a summary of the National Waste Bill of South Africa. It looks at South African industry statistics to provide an outline of local production, consumption and export figures. This background shows where packaging initiatives can be focused in the future.

Part 2: Provides details of traditional glass wine packaging and the alternatives available. The balance of this section provides an outline of the various alternative wine packaging available.

Part 3: Provides general conclusions on packaging in context of the South African wine industry and highlights areas that need addressing in the future.

## CHAPTER 2

### FACTORS PLAYING A ROLE IN SA WINE PACKAGING

*“Nevertheless, the concept of sustainable development is now known – even amongst those who haven’t accepted it – and it’s recognized, debated and followed by an increasing number of businesses.”*

Maurice Strong

Wine packaging choices are based on a variety of factors that maybe change in priority amongst different markets, both locally and internationally. These factors include:

- Consumer perception of price and quality; the more expensive the product the more it is expected to be delivered in premium packaging.
- Consumer lifestyle; more active outdoor lifestyles require convenient and shatterproof wine packaging.
- Changing interests in wine; no longer a drink for special occasions, wine is consumed more frequently. Larger quantities need to stay fresher for longer and smaller single-serves are available.
- Finally, as environmental concerns are coming ever increasingly to the fore, packaging alternatives need to factor in these criteria when packaging choices are made.

## 2.1 Wine production and consumption in South Africa

**Table 1: South African Wine Production vs. Sales Statistics**

	2006	2007	2008	2008/2007
<b>GRAPES CRUSHED</b>	<b>TONS</b>	<b>TONS</b>	<b>TONS</b>	<b>TREND</b>
White varieties	808 225	834 282	885 044	106.1
Red varieties	404 758	436 723	454 833	104.1
Table grapes	88 596	80 442	85 735	106.6
<b>Total</b>	<b>1 301 579</b>	<b>1 351 447</b>	<b>1 425 612</b>	<b>105.5</b>
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2008/2007</b>
<b>PRODUCTION</b>	<b>MILLION LITRES</b>			<b>TREND</b>
White	450.7	466.8	476.3	102.0
Red	259.0	263.7	287.0	108.8
<b>Total</b>	<b>709.7</b>	<b>730.4</b>	<b>763.3</b>	<b>104.5</b>
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2008/2007</b>
<b>DOMESTIC SALES</b>	<b>MILLION LITRES</b>			<b>TREND</b>
Natural wine	298.6	312.1	312.3	100.1
Fortified wine	33.5	34.1	33.7	98.8
Sparkling wine	8.6	9.5	10.1	106.9
<b>Total</b>	<b>340.7</b>	<b>355.7</b>	<b>356.1</b>	<b>100.1</b>
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2008/2007</b>
<b>EXPORTS</b>	<b>MILLION LITRES</b>			<b>TREND</b>
Natural wine				
White	115.9	126.7	173.6	137.0
Red	137.0	164.2	209.3	127.5
Blanc de Noir / Rosé	16.3	18.4	24.5	133.2
<b>Subtotal</b>	<b>269.2</b>	<b>309.3</b>	<b>407.4</b>	<b>131.7</b>
Sparkling wine	2.0	2.8	4.0	142.9
Fortified wine	0.5	0.4	0.4	100.0
<b>Grand total</b>	<b>271.7</b>	<b>312.5</b>	<b>411.8</b>	<b>131.8</b>
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2008/2007</b>
<b>STOCK (as on 31 December)</b>	<b>MILLION LITRES</b>			<b>TREND</b>
<b>Total</b>	<b>403.1</b>	<b>425.2</b>	<b>357.2</b>	<b>84.0</b>

Source: Sawis 2009 annual report

Table 1 gives an overview of the South African wine industry in terms of quantities of wine made, what consumers are drinking and consumption locally and internationally. An increase in the total amount of grapes crushed has led to an increase in wine production in South Africa, with over 760 million litres being produced in 2008. The trend of sales in the domestic and export market for the past three years, 2006 – 2008 has increased year on year. Specifically, sparkling wine sales have seen a small rise in both markets. Natural wine sales have increased marginally locally, yet have seen a significant growth in export sales. Sales of fortified wines in both the export and local markets have fluctuated and decreased slightly.

**Table 2: Wine Consumption in South Africa**

**WINE CONSUMPTION IN SOUTH AFRICA**

YEAR	LITRES				TOTAL % CHANGE
	* NATURAL WINE	** FORTIFIED WINE	** SPARKLING WINE	TOTAL	
1992	289 118 099	48 193 400	8 079 200	345 390 699	0.2
1993	296 060 744	35 297 200	8 381 400	339 739 344	-1.6
1994	320 378 032	36 509 698	8 568 835	365 456 565	7.6
1995	342 100 466	36 236 207	7 940 366	386 277 039	5.7
1996	359 748 332	37 975 562	7 928 130	405 652 024	5.0
1997	356 469 511	37 607 040	7 572 313	401 648 864	-1.0
1998	343 320 015	33 114 486	8 207 425	384 641 926	-4.2
1999	351 005 051	30 605 029	9 338 277	390 948 357	1.6
2000	355 203 198	28 430 650	5 605 035	389 238 883	-0.4
2001	355 660 131	28 430 650	6 193 564	390 284 345	0.3
2002	350 703 464	29 700 000	7 450 000	387 853 464	-0.6
2003	308 196 740	30 000 000	7 900 000	346 096 740	-10.8
2004	308 707 457	31 000 000	8 100 000	347 807 457	0.5
2005	299 792 670	32 000 000	8 300 000	340 092 670	-2.2
2006	298 605 362	33 500 000	8 600 000	340 705 362	0.2
2007	312 129 717	34 150 000	9 450 000	355 720 834	4.4
2008	312 354 446	33 700 000	10 110 000	356 164 446	0.1

\* Includes wine used in grape-based liquor and alcoholic fruit beverages.

\*\* Figures based on various industry sources

Source: Sawis 2009 annual report

South Africa's total wine consumption in 2008 was according to Table 2 just over 350 million litres. The table shows that since 1996, minus small fluctuations, wine consumption has been decreasing, with consumption in 2008 well below the high of 1996.

Packaging choices could constitute an important way to increase consumption as new target markets may prefer wine packaged to better suit their lifestyle. The young 18 – 34 market has been targeted by producers as a demographic for the alternative packaging segment. This younger target market who were previously not wine drinkers, is increasing especially in Europe. (Rexam website, 2009)

Carolyn Barton, wine buyer for Makro, agrees that there is a market for wine in AP, including more premium brands, and that alternatively packaged wines are suited to many different target markets. (Barton, 2009)

However, Mandy Van Wyk, from Johnny's Liquor, a premium wine store in Pretoria, disagrees and believes that, before producers start introducing new packaging formats which could jeopardize any increase in consumption, wine consumption per capita in South Africa needs to increase (Van Wyk, 2009)

Mark Norrish, Ultra Liquors says “Packaging is ultra important, and, were I in the industry, would be very careful in changing the status quo, but I would keep a close eye on other countries and local suppliers as to what they do. Look at the success of the 1.5l Van Loveren wines. Consumers are wary of change and take a long time to embrace it.” (Norrish, 2009) Ultimately, packaging to a lesser or greater extent will influence wine sales and wine consumption.

## 2.2 South African statistics – wine exports

**Table 3: South African Exports**

**EXPORTS  
TOTAL QUANTITY OF WINE EXPORTED**

YEAR	NATURAL WINE	FORTIFIED WINE	SPARKLING WINE	TOTAL LITRES	TREND	EXPORT AS % OF WINE PRODUCTION
1997	107 972 398	1 265 296	805 048	110 042 742		20.1
1998	115 782 195	1 116 766	524 676	117 423 637	106.7	21.6
1999	126 263 186	695 535	809 619	127 768 340	108.8	21.4
2000	139 800 022	471 513	685 237	140 956 772	110.3	26.1
2001	175 978 105	548 388	779 299	177 305 792	125.8	33.4
2002	215 511 730	520 936	1 360 842	217 393 508	122.6	38.3
2003	236 374 105	525 789	1 564 707	238 464 601	109.7	33.5
2004	265 761 913	413 394	1 552 886	267 728 193	112.3	38.4
2005	279 128 331	406 982	1 537 824	281 073 137	105.0	44.7
2006	269 166 556	486 549	2 018 235	271 671 340	96.7	38.3
2007	309 355 571	405 696	2 779 364	312 540 631	115.0	42.8
2008	407 377 980	423 207	3 952 009	411 753 196	131.7	53.9

Source: Sawis 2009 annual report

Whilst the local market has seen an overall decline in wine consumption, according to the data in Table 3 the total quantity of wines exported has boomed. Ten years ago the export market represented 21.6% of South Africa’s total production; in 2008 it represents almost 54%. There has been a steady decrease in fortified wine exports, due the category’s decline in popularity, however there has been a consistent growth in exports of natural and sparkling wines.

**Table 4: South African Exports: Packaged in Bulk**

**PACKAGED AND BULK NATURAL WINE EXPORTS PER COUNTRY - LITRES**

COUNTRY	2007	2008	TREND 2008/2007			
	TOTAL	TOTAL	WHITE	RED	BLANC DE NOIR / ROSÉ	TOTAL
UNITED KINGDOM	87 028 641	110 638 792	119	126	209	127
GERMANY	59 541 557	67 361 732	107	118	107	113
THE NETHERLANDS	29 027 417	29 276 173	104	101	95	101
SWEDEN	25 967 932	28 790 949	104	115	361	111
ANGOLA *	8 544 964	24 551 122	121	306	2	287
RUSSIA	2 544 415	18 345 447	1 566	121	3 351	721
U.S.A.	10 659 089	16 624 760	257	78	92	156
DENMARK	13 364 361	15 675 853	111	118	255	117
CANADA	12 984 633	13 563 548	159	77	236	104
NEW ZEALAND	5 769 528	10 902 742	173	211	640	189
BELGIUM	9 572 926	8 753 666	97	88	68	91
FRANCE	6 945 047	8 422 861	104	138	108	121
FINLAND	4 055 992	5 786 820	126	164	9 221	143
AUSTRALIA	744 609	5 630 362	981	528	186	756
REPUBLIC OF IRELAND	4 722 993	5 445 105	107	124	170	115
SWITZERLAND	4 425 953	5 264 610	126	112	108	119
CHINA	1 249 820	4 334 729	240	361	95	347
NIGERIA *	1 231 395	2 172 938	161	181	66	176
CZECH REPUBLIC	419 264	2 055 255	723	362	122	490
KENYA	2 187 420	1 798 102	88	77	137	82
NORWAY	1 602 197	1 787 713	148	106	28	112
JAPAN	1 354 792	1 783 658	145	124	231	132
ROMANIA	39 241	1 477 170	8 596	143	156	3 764
UNITED ARAB EMIRATES	899 838	1 468 698	151	172	244	163
TANZANIA	1 301 083	1 238 752	96	93	175	95
OTHER COUNTRIES	13 170 451	14 226 405	104	107	155	108
<b>TOTAL</b>	<b>309 355 558</b>	<b>407 377 962</b>	<b>137</b>	<b>128</b>	<b>133</b>	<b>132</b>

Source: Adapted from Sawis 2009 annual report

Of South Africa's wine export destination countries, the top 10 destinations as listed in Table 4, contribute around 90% of the export total. The UK alone constitutes a large portion of South Africa's exports. The UK produces very little of its own wines and mainly relies on imported wines to satisfy its demand. Around one billion bottles of wine are consumed in the UK every year, making it a vital target market for South African wine exporters. It is one of the countries that are at the forefront in trying to curtail its packaging waste. (WRAP: Bottling wine in a changing climate, 2009)

As UK retailers are increasing their targets and goals to reduce their carbon footprint, international wine suppliers including South Africa are under pressure to conform; for example, UK supermarket Sainsbury's aims to reduce their CO<sup>2</sup> emissions by 25% by 2012. (Davis, H. 2008)

South African producers need to be aware that their packaging choices in the not too distant future could have a direct impact on their business, especially where wine exports are concerned. Focusing on sustainable packaging could help ensure that producers do not miss out in gaining market share from other international wine producers who are taking strides in this area, such as Australia.

President of Boisset Family Estates, Jean Charles Boisset says, “We are very lucky to have a beautiful product in wine. It’s cultural, traditional and has a strong sense of identity. It offers a great way to demonstrate to the world what can be done in sustainability and to explain how we can make the world a better place.” (Kalkowski, J. 2008)

Environmental concerns, plus cost management due to the global economic crisis have increased sustainable development, although critics still argue that initially higher costs are incurred to implement sustainable practices. Where packaging materials cannot be re-used, the next best choice would be to recycle. If this is not viable, then any waste should be disposed of efficiently, with as little as possible going into landfill. Chateau Larose Trintaudon, was the first European vineyard to be certified for sustainable development in 2004 and is owned by insurance company EGF-Allianz. General Director, Bruno Pastre says, “We manage to do everything without spending more, we just do it more intelligently.” (AFP, 2009)

Wine writer, Oz Clarke, acknowledges that climate change is a reality and that savvy wine producers and distributors could use this to their benefit. By being socially conscious they could be seen as caring for the environment which could see sales increase. (Livonen, J. 2009)

Backsberg is South Africa’s first carbon neutral winery. It offsets all of the carbon emissions that are generated in the production process. An online calculator for businesses to work out their carbon footprint is available online. Simon Back, from Backsberg, says that the company has already moved most of its ranges to lightweight bottles. Aside from the environmental concern, he feels ‘green’ packaging options will become a buying criterion in certain markets, especially export markets in the future. He says that the South African consumer is currently resistant to change and is still a long way away from accepting quality wines in AP. (Back, 2009)

## 2.3 Legal obligations and requirements

The South African Constitution states: “Everyone has the constitutional right to have an environment that is not harmful to his or her health and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that—

- (a) prevent pollution and ecological degradation;
- (b) promote conservation; and
- (c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”

This can be seen in the recent Waste Act: Act No. 59, 2008 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008

*“To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.”*

The main objectives of Act No. 59, 2008 include -

‘to protect health, well-being and the environment by providing reasonable measures for—

- (i) minimising the consumption of natural resources;
- (ii) avoiding and minimising the generation of waste;
- (iii) reducing, re-using, recycling and recovering waste;
- (iv) treating and safely disposing of waste as a last resort;
- (v) preventing pollution and ecological degradation;
- (vi) securing ecologically sustainable development while promoting justifiable economic and social development;
- (vii) promoting and ensuring the effective delivery of waste services;
- (viii) remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and

(ix) achieving integrated waste management reporting and planning' (Government Gazette, 10 March 2009)

The bill is part of the government's plan to reduce and dispose of waste, with the aim of achieving a zero waste culture by 2022 as was drawn up by the Polokwane Declaration in 2001. Part of this plan included a target of waste reduction and disposal by 50% in 2012. To date however, there is still a yearly increase in waste volumes to landfills. (PACSA, 2010)

As an important part of The National Waste Bill, the Department of Environmental Affairs and Tourism (DEAT) has the right to an industry waste management plan, which includes the mechanism of Extended Producer Responsibility (EPR). According to Act No. 59, 2008 the EPR puts responsibility and accountability on producers, bottlers and packers to design packaging so that it can be reduced, re-used, recycled or recovered. This can be hard for producers as there are very few benchmarks to follow. To measure the business and environmental impacts of a specific packaging a Life Cycle Analysis (LCA) study could be undertaken. This examines the environmental impact at each stage of a product's life cycle. (recycling waste online, 2010), (PACSA, 2010)

Executive director of PACSA, Andrew Marthinusen, says "All of the players in the packaging industry – raw materials suppliers, converters, brand owners, importers, the wholesale and retail sectors, the recycling industry and government need to work together in all of these areas as the consequences of not fixing the perceived problem of packaging waste could be very expensive for our industry." (PACSA, 2010)

Protection of the environment is not only the responsibility of government, cities and large organizations, but also the responsibility of individuals. By recycling waste and packaging, water and energy usage among other natural resources are conserved. Individuals need to incorporate recycling into their daily routines for recycling to actually make a difference. (Glass Recycling Company, 2009)

Consumer education focusing on the reliability, sustainability and benefits of alternative packaging is vital if consumers are going to embrace these alternative products. Wineries also fear consumer rejection based on packaging choices.

Act No 59, 2008 also notes that 'poor waste management practices can have an adverse impact both locally and globally'. Internationally, the EC Directive 94/62/EC on Packaging and Packaging Waste was put into operation in the United Kingdom through the Producer Responsibility Obligations

(Packaging Waste) Regulations 1997 which sets targets for the recovery and recycling of packaging wastes and the Packaging (Essential Requirements) Regulations 1998 that specify design standards. The main purpose of the Packaging Directive is to create producer accountability for packaging and packaging waste. (recycling waste online, 2010)

### **Packaging bodies and councils**

There are numerous bodies in South Africa and overseas whose prime focus is packaging, in all of its guises. These councils, institutions and bodies can lend support, share expertise and knowledge in the field of packaging, including:

Packaging Council of South Africa (PACSA), is a voluntary body where members are categorized into Converter, Associate and Affiliate members, representing more than 60 000 employees. Converters generate almost 70% of the revenue for the entire packaging industry. Plastics Converters Association (PCA) is undertaking a study in South Africa to assess the suitability of controlled energy as a heat and power source from waste incineration. Some plastics have a 40% higher calorific value than coal. This energy source is used in Europe and it is hoped it will eventually be implemented in South Africa. Associates represent the raw material suppliers and the Affiliates are customers. PACSA is particularly concerned with environmental issues and represents the views of its members on national issues. (PACSA: environment, 2010)

The aims and objectives of Institute of Packaging of South Africa (IPSA) include, amongst others, furthering education standards in the packaging sphere and promoting the arts, sciences and technologies in the field of packaging. (IPSA, 2010)

Netherlands Packaging Centre (NVC), is a leading training, education and information provider focusing on innovative and sustainable packaging media. Whilst its focus is primarily in the Netherlands, membership is open to any company in the entire packaging supply chain, who has a business presence in the Netherlands. (NVC, 2008)

## **PART II**

## CHAPTER 3 PACKAGING ALTERNATIVES: GLASS

*“We have to shift our emphasis from economic efficiency and materialism towards a sustainable quality of life and to healing of our society, of our people and our ecological systems.”*

Janet Holmes à Court.



### INTRODUCTION

Glass is hard and inert, all but impenetrable by oxygen, carbon dioxide and most liquids. It is also brittle and breakable. It is transparent or quasi-transparent and allows light penetration. Common ingredients that go into glass production are sand ( $\text{SiO}_2$  silica), Soda ash (sodium carbonate  $\text{Na}_2\text{CO}_3$ ) and Limestone (calcium carbonate or  $\text{CaCO}_3$ ) or dolomite ( $\text{MgCO}_3$ ). The actual composition of the glass depends on its final usage; in essence, the ingredients that are melted together and cooled rapidly to form a firm structure. (Lenntech website, 2009)

Glass bottles are used for a variety of different beverages, and historically wine in glass bottles has been the most common form of wine packaging for wines across much of the price point spectrum, from entry-level easy drinking wines, to ultra-premium brands. The main characteristics of glass suit wine storage well. Millions of glass bottles are produced daily, with wine in glass bottles dominating over 95% of the global wine industry (WRAP case study). One of wine's key attributes is its long-lasting quality, making glass an appropriate choice. Plus it is readily and widely available. (WRAP case study: lightweight wine bottles)

Yet glass is not only a practical choice for wine, it has become an emotional factor too. There is a sensory experience associated with glass wine bottles, the pop of the cork, clink of the bottles, the

elegance of serving wine etc. Mandy Van Wyk, Johnny's Liquor, says that there is so much 'romance' associated with opening a bottle of wine, specifically a glass bottle with a natural cork.

Certain consumers and also producers are skeptical of alternative packaging; they see high quality products, with a high price that should be complemented with equally high quality packaging. Consumer psychologically translates the bigger, heavy bottle as being more elite and expensive and that this style of packaging is necessary to portray a certain image. Ultra-premium brands that are produced in small quantities are more appropriate for heavier packaging as opposed to entry-level and standard wine ranges. Champagne and sparkling wines that undergo bottle fermentation, find glass the best packaging option available as it is tough enough to withstand the pressure build-up during the secondary fermentation.

Most premium brands only use glass bottles, as they are perceived as traditional, up-market and ideal for long-term storage and maturation. Certain Old World wine appellations, such as Bordeaux and Burgundy would not consider any of their premium wines in anything else, partly due to historical reasons, and marketing with traditional bottle shapes and colours being synonymous with these regions. For example, traditional glass wine bottles from Bordeaux have straight sides with high shoulders with colours varying from dark green for red wines, light green for white wines and clear glass for sweet, dessert-style wines. Whilst in Burgundy and the Rhône Valley bottles have tall sloping shoulders, with a deep punt and are dark green in colour.

In the eyes of the consumer, glass still has the edge over alternatives. Heidi Bartis, Communication Manager at Distell, says "Recently a global research study was conducted by branding specialists Siegel+Gale, in which more than 2 900 consumers in nine countries were polled about their preferences regarding food and beverage packaging. The study found a 93.5% preference for glass packaging of wines based on perceptions of purity, safety, quality, versatility and recyclability. (Source: *Supermarket & Retailer*)." (Bartis, H. 2009) In 2008 in South Africa over 9 200 000l (SAWIS) of South African wine was packaged in 750ml glass bottles. This was a 7% increase on 2007.

On the down side, it is far more difficult to hold a heavy bottle and pour the contents eloquently into drinking glasses as compared to serving from a lighter bottle. Heavy glass bottles also increase the final cost per bottle to the consumer; they are more expensive for producers to produce and require corks or screwcaps, foils and labels. This translates into higher mark-ups by producers, retailers and hoteliers. Sneaky marketers could also use heavy bottles to promote a 'lesser' product, enticing consumers to believe they are purchasing a premium wine.

Some producers feel that they have no choice but to use heavy packaging for their premium ranges and resort to importing premium packaging materials from abroad (specifically bottles and corks), which in turn, is costly in terms not only of money but also greenhouse gas emissions, resulting in a far larger carbon footprint. Countries such as South Africa only have a few local bottle suppliers that hold a monopoly on the supply market and have limited offerings available, although the choices available locally are growing.

Renowned wine commentator, Jancis Robinson, has, in the past, lashed out at heavy wine bottles. Robinson launched a 'name and shame' campaign on her website, encouraging subscribers to list wines that they had encountered in very heavy bottles. (Livonen, J. 2009)

According to the UK's WRAP GlassRite Wine project case study, glass bottles account for almost 40% of all household beverage packaging (in the UK), generating close to 500 000 tonnes of packaging waste. The same case study reveals that an estimated 150 000 tonnes of packaging could be saved if reductions in bottle weight alone were made. (WRAP case study: lightweight glass bottles)

**Table 5: South African Wine Sold in Glass Containers**

**TYPE OF WINE SOLD IN 750 ml GLASS CONTAINERS**

		LITRES					Trend
	TYPE OF WINE	2002	2004	2006	2007	2008	2008/2007
<b>Natural White</b>	Chardonnay	2 444 841	2 659 949	3 206 667	3 122 636	3 233 076	103.5
	Sauvignon Blanc	4 360 107	5 159 076	7 184 813	8 098 087	8 756 066	108.1
	Chenin Blanc *		1 746 286	2 367 604	2 225 445	2 680 921	120.5
	Dry White	21 837 027	19 732 452	19 078 712	19 228 740	21 130 820	109.9
	Semi Sweet	8 028 644	6 191 079	6 479 902	6 213 353	5 658 241	91.1
	<b>Total White</b>		<b>36 670 619</b>	<b>35 488 842</b>	<b>38 317 698</b>	<b>38 888 261</b>	<b>41 459 124</b>
<b>Natural Red</b>	Cabernet	3 712 670	3 269 568	4 388 916	4 373 266	4 692 006	107.3
	Pinotage	2 307 656	2 285 192	2 798 894	2 849 294	2 848 480	100.0
	Shiraz	1 692 561	2 027 543	3 020 143	3 057 393	3 312 598	108.3
	Merlot	1 999 522	2 257 701	3 151 830	3 417 955	3 984 226	116.6
	Other red	14 469 800	17 509 796	19 936 903	20 424 713	20 932 235	102.5
	<b>Total Red</b>		<b>24 182 209</b>	<b>27 349 800</b>	<b>33 296 686</b>	<b>34 122 621</b>	<b>35 769 545</b>
<b>Rosé / Blanc de Noir</b>		4 379 854	4 827 150	4 478 707	3 983 543	5 748 467	144.3
<b>Sparkling</b>	Cap Classique	1 105 573	1 524 605	1 497 095	1 770 766	1 764 148	99.6
	Other Sparkling	5 910 828	6 441 026	6 708 930	7 384 634	7 943 038	107.6

\* Only available from 2003

Source: Sawis 2009 annual report

There has also been consistent growth in the value of wine packaged in glass bottles. Table 5, above, shows that across the board, all different grape cultivars and styles of wine in glass have increased in average wholesale price, indicating that quality wines are still being packaged in glass.

**Table 6: South African Wine Sold in Glass Containers on the Local Market**

**GLASS CONTAINER  
PARTICULARS OF PACKAGED WINE SOLD ON THE LOCAL MARKET DURING 2008**

CONTAINER SIZE	LITRES					TREND
	2002	2004	2006	2007	2008	
< 750 ml	1 998 323	1 954 009	1 578 069	1 505 399	1 281 989	85.2
% of glass	1.8	1.7	1.2	1.1	0.9	
750 ml	65 233 233	67 665 791	76 093 090	77 050 891	82 980 715	107.7
% of glass	59.1	59.7	58.0	56.9	57.2	
1 l	17 520 694	18 897 955	20 117 416	20 417 656	20 649 984	101.1
% of glass	15.9	16.7	15.3	15.1	14.2	
1,5 l - 2 l	18 831 949	17 174 267	24 596 118	27 932 931	32 180 258	115.2
% of glass	17.1	15.2	18.8	20.6	22.2	
4,5 l	6 754 764	7 587 110	8 370 923	8 095 923	7 492 568	92.5
% of glass	6.1	6.7	6.4	6.0	5.2	
OTHER	107 707	63 771	362 490	329 137	490 022	148.9
% of glass	0.1	0.1	0.3	0.2	0.3	
<b>TOTAL</b>	<b>110 446 669</b>	<b>113 342 903</b>	<b>131 118 106</b>	<b>135 331 937</b>	<b>145 075 535</b>	<b>107.2</b>

Source: Sawis 2009 annual report

Table 6 indicates the most common size of glass wine bottles is 750ml. In the past five years there has been a steady increase in 750ml glass production, as well as larger bottles: 1l, 1.5 – 2l, 4.5l. Interestingly, bottles smaller than the standard 750ml, have decreased in production in recent years. This could either be due to a change of consumer drinking habits, i.e. less sweet wines (many dessert-style wines are packaged in 375ml and 500ml bottles) or due to a move to alternative packaging, i.e. single-serve aluminium beverage cans.

Table 7: South African Wine Exported in Glass Containers vs. Other AP

COUNTRY	2007		2008		TREND 2008/2007	
	GLASS	TOTAL	GLASS	TOTAL	GLASS	TOTAL
UNITED KINGDOM	55 788 905	65 832 338	70 628 774	86 072 993	126.60	130.75
SWEDEN	6 040 955	25 919 814	5 804 934	27 782 239	96.09	107.19
THE NETHERLANDS	17 879 872	18 709 668	20 383 640	20 837 390	114.00	111.37
GERMANY	15 035 958	15 327 456	15 122 366	15 597 338	100.57	101.76
DENMARK	6 549 227	9 822 411	7 846 245	11 740 626	119.80	119.53
U.S.A.	9 547 941	9 598 050	8 400 676	8 472 468	87.98	88.27
CANADA	7 178 046	7 209 630	7 557 479	7 608 647	105.29	105.53
FINLAND	2 012 827	3 346 642	2 141 366	4 833 200	106.39	144.42
BELGIUM	4 676 639	4 870 468	4 479 437	4 806 221	95.78	98.68
REPUBLIC OF IRELAND	4 669 642	4 722 994	4 256 213	4 267 383	91.15	90.35
NEW ZEALAND	606 447	642 927	2 423 046	2 794 542	399.55	434.66
AUSTRALIA	648 725	648 725	2 353 518	2 353 518	362.79	362.79
NIGERIA *	1 211 115	1 231 395	2 168 138	2 172 938	179.02	176.46
KENYA	816 652	2 187 420	638 242	1 777 282	78.15	81.25
JAPAN	1 218 892	1 245 592	1 468 550	1 543 538	120.48	123.92
NORWAY	439 649	1 287 403	513 213	1 502 216	116.73	116.69
UNITED ARAB EMIRATES	545 266	899 838	829 673	1 468 698	152.16	163.22
ANGOLA	279 747	363 347	1 171 904	1 421 036	418.92	391.10
RUSSIA	1 446 987	1 542 063	1 121 208	1 254 372	77.49	81.34
TANZANIA	727 574	1 301 082	732 476	1 238 752	100.67	95.21
CHINA	603 448	738 580	861 266	951 784	142.72	128.87
FRANCE	509 098	517 198	814 139	856 655	159.92	165.63
SWITZERLAND	1 522 773	1 523 073	829 803	829 803	54.49	54.48
POLAND	822 526	842 126	823 325	827 925	100.10	98.31
MAURITIUS *	550 456	558 292	580 677	589 633	105.49	105.61
OTHER COUNTRIES	7 736 610	9 676 630	7 895 740	9 849 317	102.06	101.78
<b>TOTAL</b>	<b>149 065 977</b>	<b>190 565 162</b>	<b>171 846 048</b>	<b>223 450 514</b>	<b>115.28</b>	<b>117.26</b>

Source: Adapted from Sawis 2009 annual report

Table 7, illustrates how many glass wine bottles are currently being exported and the total amount of glass bottles to alternatively packaged wine products to each market. In 2008 Sweden, U.S.A, Belgium, Republic of Ireland, Kenya and Switzerland all imported less wine from South Africa in glass bottles than in 2007. In these countries more wine was imported in alternative and bulk packaging, whilst the total South African wine imported was still more in total than the previous year.

Consumers and producers alike are resistant to change as they believe that glass is the traditional packaging vessel for quality wine and that AP is for inferior and entry-level products. Whilst this may have been the predominant view in the past, the wine industry will need to adjust its thinking as producers and retailers are, or will soon be, under pressure to reduce their carbon footprint. Glass manufacturers need to adapt their production methods and increase the alternatives available, in order to retain their market share.

## TRADITIONAL GLASS BOTTLES

### Advantages:

- Historical value
- Widely accepted by consumers and retailers
- Perceived as premium wine packaging option
- Suitable for long-term maturation
- Perceived as 'greenest' wine packaging

### Disadvantages:

- Heavy
- Cumbersome to distribute
- Breakable: stock losses/ injuries to bottle handlers
- Subject to harmful UV light penetration (predominately clear and light-coloured glass)
- Temperature variation can be harmful to contents
- If closed with natural cork, possibility of 'cork taint'

## 3.1 LIGHTWEIGHT GLASS BOTTLES

Through modern technology and numerous trials, glass producers have been able to reduce the overall weight of some wine bottles. These lighter weight wine bottles look identical to their heavier, traditional counterparts. Internationally these are being used in the UK and USA amongst others. In South Africa, Consol glass has a few lightweight bottles on the market to date, with others to follow in the future.

Consol, South Africa's largest wine glass manufacturer, with over 80% market share is one of the participants of WRAP GlassRite Wine project. Two of the most popular lightweight bottles currently available that are produced locally by Consol are: The Claret bottle 1082 (Bordeaux-shape bottle) and Hock bottle 710 Riesling-styled bottle). According to Louise Jager, Consol Glass, international trends are for lightweight, claret-shaped bottles.

Australian glass bottle manufacturer, O-I, produces a range of bottles known as 'Lean and Green' that are lighter in weight than traditional packaging with some bottles being up to 28% lighter. At their current production levels this equates to a saving of more than 11 000 tonnes of carbon dioxide

annually. Following trials, O-I says that there may be further weight reductions in the future. (Hospitality magazine)

It can be argued that certain products, such as wines that are meant to be cellared for a few decades may benefit from being stored in traditional heavy bottles. The coloured glass assists in preventing light ingress, not the thickness of the glass, so wine should still mature equally as well in lighter bottles. Arniston Bay, whose wines are generally produced to be easy drinking wines that are ready to consume from the shelf, are moving away from traditional green glass and moving to clear glass to facilitate easier recycling. (Arniston Bay website 2009)

Some fear the integrity of a wine's contents cannot be guaranteed if in non-traditional packaging. Whilst wine can be affected by light, specifically UV light, a GlassRite study suggests that whilst a large reduction in bottle thickness occurs during lightweighting, only a small fall in light protection will occur. To combat this, producers could use more amber glass which has very good light-blocking properties and use coatings or additives to the glass. As amber glass is not as popular for certain wine styles and brands, green glass with a higher colour intensity could also be used. Retailers can change the direction and intensity of in-store lighting to combat light damage on the shelf. (WRAP case study: lightweight wine bottles)

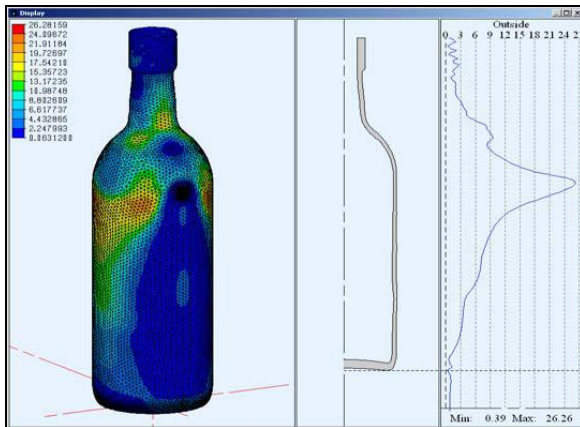
Other skeptics argue that lightweight options are not sufficiently strong enough for certain products, as it is assumed that they have thinner walls. Actually, lightweight bottles can be stronger. Modern manufacturing processes such as the 'Narrow Neck Press and Blow' result in a more even glass distribution than the 'Blow and Blow' technology frequently used in heavier bottle production.

In South Africa, Nampak Wiegand Glass has introduced new 'Narrow Neck Press and Blow' technology at their Roodekop facility, south of Johannesburg. They expect a 20% reduction in weight per bottle, whilst keeping the same height and width dimensions as before. They are expected to retail at a cheaper price, and in the logistics chain more bottles will be able to be loaded onto a pallet. The equipment is in place and Nampak have rolled out lighter-weight beer bottles, but have not produced any lighter wine bottles to date. Production in this regard is scheduled to start during 2010. (Hoogenhout, K. 2009)

With regards to bottles used for sparkling wine, being a pressurized product, there are limits to how much bottles can be lightweighted to avoid them becoming potentially hazardous and structurally unsafe.

Whilst some consumers are still skeptical about accepting wine in alternative packaging, lightweight bottles should still be able to appeal to mainstream markets, as they can be designed in such a way as to mimic the appearance of their traditional heavier counterparts. (WRAP case study: lightweight wine bottles)

**Figure 1: Results of impact leading on the outside surface of a wine bottle**



Source: WRAP: Bottle strength and the manufacture of lighter weight bottles

### 'Going Green'

Andy Gale, Tesco Category Technical Manager for Beers, Wines and Spirits said this in reference to reducing the company's CO2 emissions, "Glass is by far the heaviest component of our packaging waste and we believe we can make a substantial contribution to our target by reducing the weight of these containers."

Louise Jager, Consol Glass South Africa, agrees and says that the swing to lightweight bottles by South African wine producers has been mainly as a result of export destination countries' pressure to reduce costs and environmental damage. (Jager, L. 2009)

"The Australian wine industry is at the forefront of new technology," says Vince O'Brien from the Australian Wine Research Institute (AWRI), "In addressing that, the wine industry is looking to use lightweight glass, therefore reducing the contribution of the ultimate product to greenhouse emissions." O'Brien also says that they are looking at decreasing packaging size and at PET bottles as a replacement for glass. (Hunt, K. 2008)

In partnership with Kingsland Wines & Spirits and Quinn Glass, Tesco has introduced some own-label

wines in lighter bottles that are of a traditional shape and height, to retain the brand image, whilst still being suitable for high speed filling. (WRAP case study: lightweight glass bottles)

According to findings conducted by WRAP, up to 30% reductions of CO<sub>2</sub> emissions from the transportation of lighter weight bottles can be achieved. In South Africa the Arniston Bay Tides range is being packed in bottles 100g less in weight than previous bottles.

### **Consumer Perceptions**

Do lightweight bottles tarnish the consumers' perceptions of quality? UK retailer, The Co-operative, has noted that lighter bottles have not negatively impacted on consumers' buying decisions. A study by the University of Bangor, for GlassRite Wine, shows that, as opposed to bottle weight, bottle height played a larger part in consumers' attitudes to wine quality. To minimize the effect on consumer preference, lighter bottles should be of a similar height and shape to traditional bottles. (WRAP case study: lightweight wine bottles)

Nick Zema, chairman of the Coonawarra Vignerons' Association, says "I think there's a lot of merit in lightweight glass. It's one of those things that over time will evolve." (Hunt, K. 2008) Louise Jager, Consol Glass, agrees; "I believe that there will always be light- and heavy- weight bottles in the wine industry – but the high volume, entry level wines will move to lightweight without a doubt. They need to, in order to remain commercially competitive." (Jager, L. 2009)

The trend may follow trail of the introduction of screw caps. When screw caps were first introduced, there was a stigma attached to using them. Nowadays, mainstream and some premium wines are bottled with screw caps and are readily accepted by the majority of consumers.

### **Examples of lightweight bottles in the market place:**

There is no doubt that lightweight glass bottles dramatically reduce the carbon footprint of transporting wine. A range of bottles, Ecova, produced by Europe's largest glass manufacturer Saint Gobain weighs up to 90g less than a traditional bottle and is produced from recycled glass. (AFP, 2009)

Constellation Europe, with its large portfolio of wines, has decreased the original 495g bottle weight of their Stowells and Echo Falls ranges by 12%. With sales of 55 million units, over 3 000 tonnes of glass and over 2 000 tonnes of CO<sub>2</sub> emissions are being saved annually. (WRAP case study: lightweight wine bottles)

Chilean winery Viña Ventisquero Ltd, was the first international producer to lightweight bottles specifically for the all important UK market. (WRAP case study: lightweight wine bottles)

Distell has also started lightweighting some of their bottles, reducing the weight of bottle of mainstream brands from 600g to 450g. Distell estimates that with lightweighting of other products across their portfolio, they will annually save over 6 400 tons of glass and reduce carbon emissions by 14 000 tons. (Bartis, H. 2009)

Many other South African producers are starting to follow suit, with lightweight bottles already in their product range or being considered.

### 3.2 RECYCLED GLASS



#### **What is Recycled glass packaging?**

Generally, the recycling process of most products requires less water, energy and other resources to recycle materials and turn them into new products. Cullet refers to recycled and glass waste. It melts at a lower temperature than new glass production, therefore manufacturers use less resources to melt the same quantities of glass and quality is not compromised. (Glass Recycling Company, 2009)

1 ton of glass = 1 ton of cullet

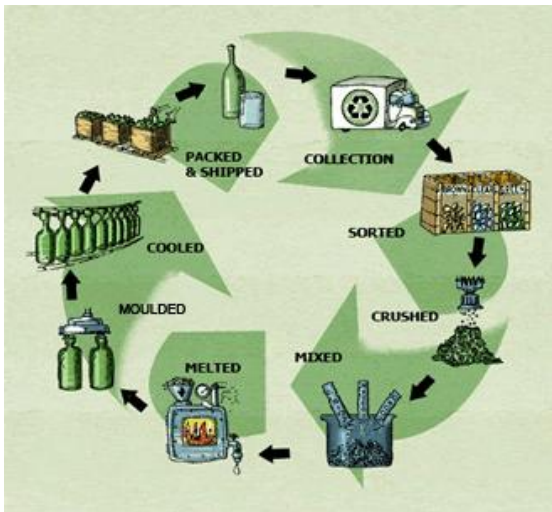
1 ton of glass = 1.2 tons virgin glass production material

Louise Jager, Consol Glass says about cullet usage, "Use of cullet in the furnace is slightly more cost effective. However, collecting and processing cullet from landfill and other collection centres is expensive primarily due to the distances (travelled) in SA". Increasing the recycled content of glass packaging is one of Consol Glass's primary carbon management strategies. (Jager, L. 2009)

Another way to reclaim packaging is to re-use it in its original format. Glass bottles are sturdy and capable of withstanding rigorous cleaning procedures and handling, making this a viable option. The re-use of glass is dependent on how easy it is to collect, return and clean them in order for bottles to be ready for re-use. (PACSA: environment, 2010), (recycling waste online, 2010)

An additional amount of energy is required to actually recover and recycle the glass, which still adds more energy emissions to the carbon footprint. The bottle weight once the glass has been recycled is often still the same as traditional bottle weights. Issues with carbon footprint still remain. The amount of space the bottles take up in a truck or container is the same as non-lightweight options.

**Figure 2: Glass Recycling Process**



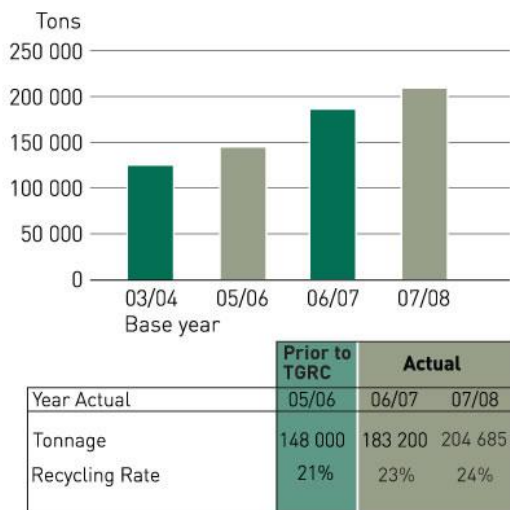
- **COLLECTION**  
Glass is collected and taken to a processor.
- **SORTED**  
Glass is sorted by colour, cleaned and broken.
- **CRUSHED**  
Glass is crushed into tiny pieces called cullet.
- **MIXED**  
Cullet is mixed with silica sand, soda ash and limestone.
- **MELTED**  
The mixture is melted to a molten state in a furnace.
- **MOULDED**  
The molten glass is poured into moulds.
- **COOLED**  
The glass is cooled slowly to increase its strength.
- **PACKED & SHIPPED**  
New glass containers are filled and returned to the shelf for resale

Source: The Glass Recycling Company, Accessed 26/07/2009

Consumers generally perceive that wine in regular glass bottles is the ‘greenest’ option available, as glass was one of the first products they have become accustomed to recycling. However, it can only be seen as ‘green’ if it is indeed recycled.

4,7% of South Africa’s total waste is made up of glass. Glass can be 100% recycled; the problem lies in the fact that only 25% of non-returnable glass containers that are produced in South Africa every year are collected from the waste stream for recycling before they end up in landfill. Locally glass recycling stations are located throughout the country. This recycling rate is low, considering glass is 100% and infinitely recyclable, and compared to recycling rates for other countries (Glass Recycling Company): Netherlands – 90%, Australia – 50% and the UK – 45%

**Figure 3: South African Glass Recycling Performance Report**



Source: The Glass Recycling Company, Accessed 26/07/2009

The question for retailers and consumers on the ‘green’ front would then be to support lightweight, re-used or recycled bottles? Ideally the answer would be all three.

**LIGHTWEIGHT, RE-USED AND RECYCLED GLASS BOTTLES**

**Advantages**

- Less GHG emissions emitted during production
- Lower carbon footprint during transport: for filling and thereafter during distribution (for lightweight bottles)
- Maintains visual and tactile appeal similar to traditional glass bottles

- Allows for traditional closures, i.e. natural cork
- Easier to pour
- 'Green' appeal

### **Disadvantages**

- Suitability still needs to be established for bottle fermentation of Cap Classique- style wines
- Breakability: stock losses/ injuries to bottle handlers
- A large portion of GHG emissions are still produced in the recycling process
- Weight of re-used and recycled bottles may be similar to that of traditional, heavier bottles

### **Glass Summary**

Whilst certain boutique premium brands, sparkling wines and wines that require long term maturation, may still warrant the use of traditional heavy glass bottles, a 'green' move by wine producers could help reduce energy consumption, and increase customer appreciation. Complex questions remain about how to increase recycling, and the mechanisms needed to boost it. One possibility would be to introduce bottle refunds, in order to collect and re-use wine bottles. One advantage of this approach is that bottling lines are already laid out for these bottles, making filling, corking and labelling relatively straight forward. This approach would be even more energy efficient than recycling. It would also be economical for the producer and the consumer who could still enjoy the benefits of the heavier packaging, knowing that it is in part 'green'. Disadvantages are that these bottles still need to be cleaned properly before re-using and the logistics costs involved in collection of the bottles and the CO2 emissions used in this process.

Local glass bottle suppliers need to offer more alternatives in terms of recycled bottles, lightweight bottles, etc. If the technology does not yet exist here, then partnerships should be formed with international suppliers.

When exporting wine, producers and distributors should consider bulk shipping where applicable, and bottling wine in the final destination country. While this would considerably decrease the carbon footprint in transporting wine, it would however, have a negative impact on the local economy, as there would be job losses at packaging suppliers and bottlers due to less demand. For the local market lighter weight bottles specifically for non-premium ranges should be employed and, where possible, they should be recycled. Distell actively supports the Glass Recycling Company and also makes use of returnable bottles where they can be re-used for certain products within stringent health and safety specifications. (Bartis, H. 2009)

Consumer perceptions need to change in regard to thinking that 'bigger is better'. The better educated the wine drinking consumer is on wine and packaging, the easier it will be for marketers to change their thinking and for consumers to embrace AP wines. Perhaps a labelling system could be implemented on South African wine bottles that indicates whether a bottle is lightweight, re-used or has been recycled, to aid consumers in making informed decisions when purchasing products.

Compared to other forms of AP wine packaging, most consumers are aware that glass bottles can be recycled and re-used. A significant infrastructure is already in place for glass recycling. (recycling waste online, 2010). The Glass Recycling Company uses money from its supporters to communicate to and educate consumers. It has also increased the number and availability of recycling bins around the country. (PACSA, 2010)

Consol Glass has invested millions of Rands in cullet colour sorting equipment in its Johannesburg and Cape Town plants. Glass can be sorted automatically by a light sensor into different colours and is sent to its respective recycling stations. (PACSA, 2010)

## CHAPTER 4

### CONTEMPORARY PACKAGING ALTERNATIVES: PET BOTTLES

*“We shall require a substantially new manner of thinking if mankind is to survive.”*

Albert Einstein

*“The more people understand the cost of oil, the cost of energy, the cost of everything, the more people realize our efforts should be put into the quality of the wine rather than into the package itself.”*

Jean Charles Boisset. (Kalkowski, J. 2008)

#### PET BOTTLES



What is it?

Polyethylene Terephthalate (PET) is a non-leaching food standard thermoplastic developed in the 1970s. PET can be moulded into shapes and containers, including wine bottles. Louis Moodie, Mondi Sales Manager – PET & New Business, has received positive feedback from the wine industry in South Africa, in regards to wine in PET, with some winemakers seeing the product as innovative, while others feel a moral obligation to the environment to reduce CO<sub>2</sub> emissions. (Moodie, L. 2010)



PET bottles may be constructed in a single layer (monolayer) or be multi-layered. Monolayer PET bottles that are suitable for wine production are produced with an oxygen scavenging additive mixed into the PET before moulding to form an active barrier. This means a large concentration of active ingredient needs to be added, to prevent a diluting effect, as it has to cover the entire cross section of the wall of the bottle.

Multi-layer PET bottles are typically constructed with three layers. The bottle wall consists of the inner & outer layer being made from conventional PET that has no oxygen scavenging additives included in it, which sandwiched in-between a nylon or EVOH passive barrier. This passive barrier will include an active ingredient for

oxygen scavenging purposes. As the active ingredient is spread over a much smaller area (the middle layer) the concentration of the oxygen scavenging additives is much better.

There have been concerns in the past about the 'breathability' of plastic and that oxygen may permeate through to the wine and taint the flavour of the wine. Bottle supplier, VIP Packaging's PET Business Manager, Daryl Black explains, "We have been working on our PET wine bottle solution for some time now with the objective of making sure we wouldn't compromise the taste of the wine, quality or aesthetics of the packaging." (Packagingmag.com - Wolf Blass, 2009)

Some of the different options to combat oxygen ingress are by using oxygen 'scavenging' technology such as DiamondClear™ or MonOxbar Plus™ scavenging technology and Plasmax internal silicon oxide barrier coating. Oxygen scavengers are activated by the presence of moisture, therefore once the bottle is filled with wine. VIP Packaging's DiamondClear™ claims that, weight for weight DiamondClear™ active monolayer materials have around five times more oxygen absorption capacity than other competing oxygen scavengers and limit the amount of oxygen that can permeate into the bottle. (Packagingmag.com - Wolf Blass, 2009)

Constar International blend MonOxbar Plus™ into PET, which are formed into monolayer bottles. Wines in PET bottles with Plasmax internal silicon oxide barrier coating (from KHS Corpoplast North America) eliminate oxygen permeation and carbon dioxide loss. The coating is a very thin, clear impermeable layer of silica (SiOx) that is resistant to abrasion, delimitations and does not disintegrate over time. Plus it does not affect the appearance, taste or quality of wine. (Constar.net, 2009)

Some claim concern over various scavenger technologies that purportedly start dissolving once they are applied. Vice President of Operations at Artisan Wine Co. says "After reviewing the systems on the market, we selected Ball Corp.'s Plasmax-coated bottles, because the silicon oxide is a passive barrier. We can keep the bottles with the Plasma coating in inventory as long as necessary without losing any of the barrier properties." Similar to DiamondClear™ scavenging technology, this ultra-thin coating of nonreactive silica (SiOx) can be removed during recycling. (Packaging digest – PET bottles have coating, 2009)

Oxygen scavenging technology is available to South African PET producers through license agreements with international companies that have developed this technology.

## GREEN

Compared to the average 440g weight of glass wine bottles, PET bottles only weigh, on average 54g (Wolf Blass). WRAP together with Artenius PET Packaging (formerly Amcor), trialled prototype Wolf Blass PET wine bottles in UK retail stores, such as Asda, Sainsbury's and Tesco's. (WRAP case study: lightweight glass bottles). 'Developments in PET resin technology and conversion equipment have reduced package weights up to 31% since the introduction of PET 25 years ago. A two-litre preform that weighed 68 gms in 1980 now weighs 47 gms. (Petcore, 2010)



PET bottles produce fewer greenhouse gas emissions during the transportation of filled and unfilled bottles than glass bottle production. PETRA, the PET Resin Association for North America lists a case study undertaken in conjunction with Husky Injection Molding Systems Ltd. - 'Beverage Package Performance in North America.' The LCA was undertaken with the following packaging alternatives for wine: a 750ml PET bottle, weighing 45g and a 750ml glass bottle, weighing 611.6g, both bottles were sealed with a 4.4g metal closure. Results concluded that PET had the lowest GHG emissions with 732.5 lbs/ 1 000 units compared to glass at 1 395.8 In regards to energy consumption again PET had the lowest consumption with 7 132MJ/ 1 000 units, followed by glass at 12 480 MJ/ 1 000 units (PETresin.org 2010)

## LOGISTICS

In its unfilled state, a PET bottle is around 90% lighter than a regular 750ml wine bottle. Therefore GHG emissions are reduced during the production and transport. However, wine normally needs to be transported in bulk to a PET bottling facility. (Packagingmag.com - Wolf Blass, 2009)

Handling of bottles is safer than glass, with less chance of bottle production workers being injured by broken glass and less chance of damage and stock loss through breakage to the full bottles during transportation.

For filling PET wine bottles, wine could to be transported in bulk to a nearby PET bottling facility as not many wine producers have the appropriate machinery needed to fill the bottles. This is an additional cost in money and carbon footprint that needs to be factored in. As this form of wine packaging increases in popularity bottling plants need to have the capacity to cope with quantities of wine. Etienne Skien, from Mondy, believes that PET bottles will fit on most bottling lines that are used for

750ml glass bottles, with only minor adjustments needed to facilitate the change from glass to PET. (Skien, E. 2010)

As bottling lines are expensive, only very large producers and distributors may have their own bottling lines that are suitable for PET bottles. At present there is at least one mobile bottling plant in the Cape that bottles wine in PET at individual wineries. (Moodie, L. 2010) This is the most cost efficient option available for smaller producers.

PET cuts the transportation energy used in the global food supply chain in half. The total transportation energy (required to deliver packaging to filler and from filler to retailers) for an average kg PET in the form of beverage packaging is 13.7 MJ diesel compared to 25.4 MJ per kg substituted PET for the average glass beverage packaging' (Petcore, 2010) Plus in transporting bottles, 1000 cases of glass bottles fill a container, whilst the same container can hold 1750 cases of PET bottles. (Kalkowski, J. 2008)

### **SUITABILITY**

Another benefit of PET is that the wine can be packaged in green bottles – made to mirror glass and being able to protect the wine from UV light better than clear glass. The bottles can be moulded into various shapes and sizes including the standard 750ml bottle and a 187ml bottle suitable for hotels and airline use, as well as colours to mimic glass wine bottles i.e. green, amber, clear. The shatterproof bottles are easy to handle, transport and pour. No special implements are needed to open the bottles. Wrap around packaging is available, and paper with wet-strength properties assists in labels resisting water when inserted in ice buckets. (Packaging mag: PET wine bottles have coating, 2009)

By blow-moulding the bottles, various shapes and sizes can be formed, such as Burgundy and Bordeaux-style bottles. (Kalkowski, J. 2008). Bottles can closely resemble the look of glass, including the typical etching found around the base of wine bottles. (Polypet.co.za. 2008). PET can be pigmented to offer limited UV light transmission. In South Africa Polypet and Mondi produces PET wine bottles, with various sizes of PET wine bottles are available: 187ml, 750ml and 1 litre. Size for size, PET bottles are cheaper to purchase opposed to a regular 750ml wine bottle. For producers bottling thousands of bottles, this can be a significant saving.

Bottles can be closed with plastic Novatwist or aluminium metal closures, such as Stelvin screwcaps. These closures prevent possible 'cork taint' that sometimes occurs in glass wine bottles that are sealed with natural cork. (Packaging magazine, PET wine bottles have coating, 2009)

The lifespan of unfilled and filled PET bottles has been the downfall of PET in the past. PET should be used for wines that are meant to be readily consumed within 12 months, although the recommended shelf life is between 6 - 12 months. Wines that require bottle maturation to soften tannins and integrate flavours should be bottled in glass, whereas fruit-forward wines that are ready to consume now are suited to PET packaging. (Ryan, R. 2009) Mondi manufactures bottles that, by exclusive arrangement under license from Artenius PET Packaging, contain the Amguard Bind-Ox additive which extends the shelf life up to 24 months. (Moodie, L. 2010)

## **RECYCLABILITY**

PET bottles can be recycled and household waste can be minimized as the bottle can easily be crushed and folded. As with all the packaging options that are recyclable the other issue is to ensure that they do in fact get recycled. (Packagingmag.com - Wolf Blass, 2009). Patrick Rooney, co-founder and Director of Corporate Development for Planet Green says that of the 200 billion PET bottles blown annually, close to 150 billion go into landfill, ditches, oceans or rivers which can negatively affect the recycling stream. (Packagingmag.com – 'Revertable Oxo Biodegradable PET Plastic Bottle', 2009)

Recycling plastics is more complicated than some other AP as there are seven main groups of plastics. A polymer logo printed on the plastic package indicates how or if the package can be recycled. Executive Director of PACSA, Andrew Marthinusen, says "It is extremely disappointing and in my view irresponsible that many plastic packages still do not clearly show the polymer logos – in most cases this means that the recyclers are not prepared to risk processing these packs and they land up on the landfill." (PACSA, 2010)

The PET Recycling Co (Petco), the South African industry-led PET recycling oversight, collects a PET recycling fee which is used to fund recycling projects and awareness. In South Africa at present, unskilled labour sifts through rubbish at municipal dumps and sorts the PET bottles into different colours. In terms of recycling, the clear PET is most valued, followed by blue then green. Most wine in PET is bottled in green bottles but flint coloured PET is also available. The bottles are then sent to companies such as Extrupet and Hosaf Fibres for recycling.

In 2007 almost 24% of PET beverage bottle total sales were recycled. This equates to 18 734t of PET and a saving of 28 101t of carbon dioxide from being released into the atmosphere. Petco has invested over R100m in establishing a PET recycling infrastructure in South Africa. This in turn has created new markets for recycled plastic materials and more than 10 000 informal jobs. (PACSA, 2010)

Planet Green Bottle in Vancouver, Canada and UK partner, Wells Plastics have introduced an additive, Reverte™ to PET that causes the plastic bottles to oxo-biodegrade in a 10 – 20 year lifecycle. Andrew Barclay, Director of Research and Technology for Wells Plastics Ltd. (UK) says on the addition of Reverte™ “We use only 1½ % additive by weight to each bin of PET plastic feedstock in order to manufacture a PET plastic bottle with a programmed shelf life of 2 years before oxo-biodegradation starts.” The oxo-breakdown starts with exposure to heat, direct sunlight and oxygen. Then there is a second phase of biodegradation components that encourage the growth of microbial colonies; this speeds up and assists in total biodegradation of the plastic which eventually converts itself into CO<sub>2</sub> and water. (Planet Green Bottle website, 2009) (Havercroft, N. 2009)

Patrick Rooney, co-founder and Director of Corporate Development for Planet Green says, “We program the molecular breakdown of the plastic over a long enough time to ensure proper shelf life.” Planet Green is aligning global strategic bottlers to be their local partners. There are currently no strategic partnerships in South Africa. (Packagingmag.com – ‘Revertable Oxo Biodegradable PET Plastic Bottle’, 2009)

‘The Bioplastics Council of the US-based Society of the Plastics Industry (SPI) has joined the others in questioning the scientific validity of biodegradability claims made by producers of oxo-degradable and oxo-biodegradable products.’ Says Mike Verespej, on the Petcore website. (Petcore is a European-based trade association for PET container recycling.) Sceptics have asked additive producers to supply evidence to prove that these additives don’t curtail the lifespan of plastics produced from recycled resin. (Verespej, M. 2010).

## **CONSUMER PERCEPTIONS**

Whilst most producers are concerned about the environmental footprint of their packaging choices, many are worried about their product’s image being tarnished as cheap or inferior. “The packaging (Wolf Blass Green Label) is in response to market demand and a clear consumer insight suggesting

that 96% of consumers today claim they'd like brands to show them how they are helping climate change and the environment", says Oliver Horn, Global Brand Director, Wolf Blass (STW. Group Ltd, Climate Change 2007) (Packagingmag.com - Wolf Blass, 2009)

James Reid, Constellation Wines South Africa, agrees that in principle they (Constellation) would consider using PET, however he feels that it still requires further investigation in terms of any potential quality control issues and consumer perception. (Reid, J. 2009)

**Examples of products in the market place:**

In October 2009, at the South African Mega Tasting in London, Roger Harris Wines and Paul Sapin SA launched a range of South African wines packaged in PET bottles under the brand name Khulu Sky. The wines are packaged in 187ml and 750ml lightweight, multi-layer PET bottles sealed with a PE screwtop capsule. The range was developed for informal and outdoor living and is sold in the UK. (Talking Retail, 2009)

Hugh, Kevin & Robert Wines' new line of wines called "Greener Planet Sustainable" with a low carbon footprint and packaged in lightweight PET bottles already produces 85 000 cases per year, retailing at over \$10 per bottle in the USA. (AFP, 2009)

Australian wine company, Wolf Blass have reduced their greenhouse gas emissions (GHG) by 29% through the production of their Green Label wines. The unfilled PET bottle weighs around 51g, which compared to a traditional glass bottle, 515g, is a large saving on GHG emissions that are generated through the transport of PET.

One of Spain's biggest producers J.Garcia-Carrion (JGC) has released one of its best selling brands, Don Simon Class in PET bottles to their U.S. market. Jose Garcia-Carrion Jordan says "As producers and global distributors of consumer goods, we have an environmental responsibility to prevent waste of potentially useful materials while helping reduce pollution. By using eco-friendly non-glass bottles, we hope to promote environmental consciousness and bring our consumers a product they can feel good about enjoying." (Packaging digest - PET wine bottles have coating, 2009)

The Artisan Wine Company, in British Columbia, Canada - Painted Turtle range comes in PET bottles that have an internal coating of silicon oxide (SiOx), which protects wine against oxygen ingress. (Packaging digest, 2009)

## **PET Wine Bottles**

### **Advantages**

- Can be recycled
- Weight of unfilled bottle very light
- Shatterproof
- Flexible, can be shaped and colour-coded to replicate traditional glass bottles
- Re-sealable
- Convenient

### **Disadvantages**

- Cannot be closed with natural cork
- Limited shelf life
- Not suitable for long-term maturation

## CHAPTER 5

### CONTEMPORARY PACKAGING ALTERNATIVES: TETRA PAK CARTONS



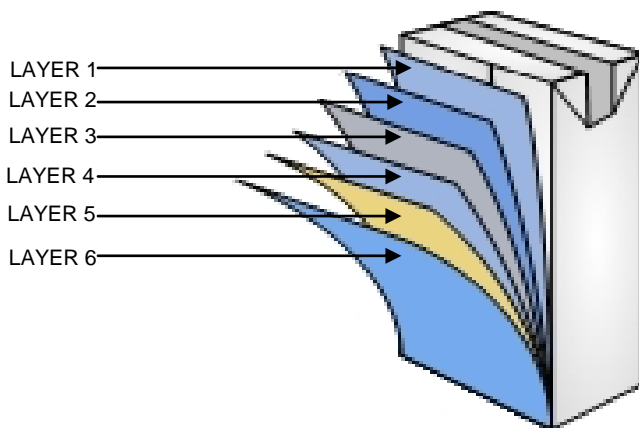
*"We must adjust to changing times and still hold to unchanging principles."*

Jimmy Carter

What is it?

Tetra Pak cartons are polycoated containers that comprise 70% paper. They contain three different materials in six alternate layers:

**Figure 4: Composition of TetraPak Cartons**



Layer 1: polyethylene to seal in contents (wine comes into contact with this layer)

Layer 2: polyethylene that promotes bonding between layers 1 and 3

Layer 3: aluminium foil to create a barrier against the negative effects of light and air

Layer 4: polyethylene that promotes bonding between layers 3 and 5

Layer 5: paperboard providing shape and stiffness

Layer 6: polyethylene to give protection against external moisture

Source: Tetra Pak. 2009

From the consumer's perspective, they are durable and shatterproof, portable, easy to stack in the fridge, especially those with screw caps, offer great value, obtaining 25% more wine than a regular 750ml bottle. There is less chance of taint, as compared to wine bottled with a natural cork. Tetra Pak cartons are designed to be lightweight, space-saving and recyclable. The contents have a shelf life of up to 12 months. (Tetra Pak, 2009)

In South Africa there has been marginal increase in the production of Tetra Pak cartons in the last few years. In terms of size, 1l is, by far the most popular, followed by larger sizes i.e. 1.5l. See Table 8.

**Table 8: Production of South African Wine in Tetra Pak Cartons**

TYPE OF CONTAINER	CONTAINER SIZE	LITRES				TREND 2008/2007
		2002	2004	2007	2008	
TETRA PACKS	500 ml	674 866	594 477	649 778	274 655	42.3
	% of tetra packs	14.1	12.6	14.3	5.7	
	1 l	4 123 757	3 948 602	3 501 333	4 127 133	117.9
	% of tetra packs	85.9	83.5	77.0	85.9	
	OTHER	0	184 871	395 069	402 592	101.9
	% of tetra packs	0.0	3.9	8.7	8.4	
	<b>TOTAL</b>	<b>4 798 623</b>	<b>4 727 950</b>	<b>4 546 180</b>	<b>4 804 380</b>	<b>105.7</b>
	<b>As % of total natural wine</b>	<b>1.5</b>	<b>1.7</b>	<b>1.5</b>	<b>1.6</b>	
<b>TOTAL NATURAL WINE</b>		<b>322 353 107</b>	<b>285 565 841</b>	<b>301 061 153</b>	<b>304 532 265</b>	<b>101.2</b>

Source: Adapted from Sawis annual report 2009

Wine exported from South Africa in Tetra Pak cartons to international markets decreased slightly between 2007 and 2008. By the total wines exported to the countries listed in Table 9 (SAWIS), wines in Tetra Pak Cartons account for an extremely small portion of our current exports. However, wines in cartons is gaining some popularity internationally, with wines in Tetra Pak cartons growing by 48% in 2008 in the USA. (Packaging Digest – “CalNaturale wine introduces new carton packaging”, 2009)

UK supermarket Tesco has seen a rise in sales of 3.7% from 2008 to 2009. Victoria Moore, UK wine writer for the Guardian, writing for Harpers Wine & Spirit Trade Review, says that “my problem with all

this, is that the emphasis is too much on packaging and not enough on what goes into it.” Tesco’s beers wine and spirits Technical Packaging Manager, Andy Gale, agrees “If the quality and choice of the wine inside most alternative packaging wasn’t so abysmal, we’d all buy more of it.” Andy Gale notes that there is acceptance in the market for wines in Tetra Pak cartons, “so we’ll look at doing more – moving out of value and using it for wine at higher prices.” (Moore, C. 2009)

**Table 9: Exports of South African Wine in Tetra Pak Cartons**

COUNTRY	2007		2008		TREND 2008/2007	
	TETRA PACKS	TOTAL	TETRA PACKS	TOTAL	TETRA PACKS	TOTAL
UNITED KINGDOM		65 832 338	1 200	86 072 993		130.75
SWEDEN		25 919 814		27 782 239		107.19
THE NETHERLANDS		18 709 668		20 837 390		111.37
GERMANY		15 327 456		15 597 338		101.76
DENMARK	744	9 822 411		11 740 626		119.53
U.S.A.		9 598 050		8 472 468		88.27
CANADA	27 264	7 209 630	3 840	7 608 647	14.08	105.53
FINLAND		3 346 642		4 833 200		144.42
BELGIUM		4 870 468		4 806 221		98.68
REPUBLIC OF IRELAND		4 722 994		4 267 383		90.35
NEW ZEALAND		642 927		2 794 542		434.66
AUSTRALIA		648 725		2 353 518		362.79
NIGERIA *		1 231 395		2 172 938		176.46
KENYA		2 187 420		1 777 282		81.25
JAPAN		1 245 592		1 543 538		123.92
NORWAY	6 456	1 287 403	15 792	1 502 216	244.61	116.69
UNITED ARAB EMIRATES		899 838		1 468 698		163.22
ANGOLA		363 347		1 421 036		391.10
RUSSIA		1 542 063		1 254 372		81.34
TANZANIA		1 301 082		1 238 752		95.21
CHINA		738 580		951 784		128.87
FRANCE		517 198		856 655		165.63
SWITZERLAND		1 523 073		829 803		54.48
POLAND		842 126		827 925		98.31
MAURITIUS *		558 292		589 633		105.61
OTHER COUNTRIES	98 784	9 676 630	99 300	9 849 317	100.52	101.78
<b>TOTAL</b>	<b>133 248</b>	<b>190 565 162</b>	<b>120 132</b>	<b>223 450 514</b>	<b>90.16</b>	<b>117.26</b>

Source: Adapted from Sawis annual report 2009



As opposed to transporting empty bottles to be filled, empty Tetra Pak cartons come in a roll. One lorry of empty Tetra Pak cartons equates to 26 lorries of empty glasses, thus transportation before filling alone is a huge saving in carbon emissions. Added savings for the producer are that there are no corks, foils or additional labels (needed for bottles) required. Cartons are cheaper than glass and can be distributed more efficiently once full, they are easy to stack and more can be transported in one load than glass.

The contents are protected from any harmful effects of light, and are protected from oxygen and micro-organisms. A recent study at Brock University, Ontario in Canada found the Tetra Pak-style preferable to glass bottle storage as the best packaging option to prevent certain chemicals spoiling wine. Nick-named 'ladybug taint', Alkyl-methoxy-pyrazines are found in the remains of insects that have been crushed along with the berries at the start of the winemaking process, plus it is also found on the bloom of grapes. Wines in cartons absorbed up to 45% of the chemicals. However, for long-term storage, glass was still favoured as cardboard vessels were more likely to suffer oxygen penetration. (Holter, G. 2009)

Amongst the different Tetra Pak carton options, Tetra Rex™, whilst ideal for non-aseptic products such as milk and prepared foods, is not best suited for wine. Aseptic Tetra Pak cartons refer to contents that are stable at room temperature, as opposed to non-aseptic that need chilled distribution e.g. pasteurized products

The cartons are difficult to recycle as the packaging contains multilayer materials. In Europe there are technologies in place to recover multilayer products. However, this is done under controlled conditions to ensure that no toxic chemicals are released. There is currently no provision for this in South Africa. ([www.pacsa.co.za](http://www.pacsa.co.za))

**Examples of products in the market place:**



Arniston Bay 1-litre 100% recyclable Tetra Pak carton can be stored for nine months before use. A 1 litre holds 33% more than a regular 750ml bottle, providing good value to consumers. It takes up less space in shipping containers, which can transport up to a third more cartons. (Arniston Bay, 2009)

Distell launched four wine brands in Prisma packaging a few years ago. This variation of wine in cartons is an octagonal Tetra Prisma pak with a screw cap closure. The screw cap allows the bottle to lie on its side for storage without fear of leakage.



Distell Brand manager Shelley Ellse says, “Our innovation is a response to the ongoing and robust growth of various new packaging formats in major overseas markets where convenience and recycling have been the major driving forces.” The Prisma packs were on the shelf for around one year before being culled.

According to Distell’s Communication Manager, Heidi Bartis, “Domestic wine sales in Tetra Prisma packs are miniscule. In

South Africa, we have found there is still some resistance to premium brands being presented in this format as they are not associated with quality offerings. However, we are confident that consumers

will begin to see the merits of this form of packaging in due course. It is eco-friendly, convenient and ideal for outdoor entertaining.” (Bartis, H. 2009) (fastmoving.co.za)

AP appeals to a younger market, and may encourage new wine drinking consumers. Ellse says “Instead of wine being perceived as intimidating and complicated, the new Prisma packs are welcoming and fun, flying in the face of convention”. (fastmoving.co.za)

Californian Three Thieves’ Bandit range of wines launched its high-quality wine in Tetra Pak aseptic packaging in 2002. (world wine.com, 2007)

## **TETRA PAK WINE CARTONS**

### **Advantages**

- Miniscule carbon footprint before filling
- Carbon footprint during transport less than glass
- Logistically easy to pack
- Shatterproof
- Could appeal to new target markets

### **Disadvantages**

- After initial opening some closures can leak if box left on its side
- Limited shelf life, not suitable for long term storage
- Product cannot be seen
- Image of containing entry-level or poor quality wine

## CHAPTER 6

### CONTEMPORARY PACKAGING ALTERNATIVES: ALUMINIUM CANS

On promoting wine to the average consumer:

*“If you were developing a new fruit beverage today, would you put it in a glass bottle that comes in only one size and requires a special implement to open?”*

Larry Lockshin, director, Wine Marketing Group, University of South Australia. Aug 2004



What is it?

Cans manufactured from aluminium, sometimes referred to as drinks or beverage cans. Even though cans used to be relatively cheap to purchase, the cost of aluminium has rocketed in recent times, making them more expensive. A big problem for smaller producers is the cost of filling cans, as special bottling facilities are required. Producers would need to send the cans and ends to a filler (co-packer), and the wine would have to be delivered in bulk to the filler. “The cans are filled with wine then seamed closed and packed in trays covered in shrink wrap.” Says Irene Martinez, Category Development Manager for Rexam Beverage Can Europe and Asia. (Martinez, I. 2009) When filling cans no alterations are made to the wine, but liquid nitrogen is added for wine preservation. The shelf life is 12 months. (Rexam, 2009)

Wines in cans are a relatively new packaging alternative that can be stylish looking, with matt or glossy varnish. Applications for maximum product differentiation include use of different inks: UV and glow-in-the-dark, thermochronic (changes colour when beverage reaches optimum temperature). Cans could be embossed with a pattern or have customized painted ends and pull-tabs. They generally come in a single-serving format in 200ml and 250ml formats. (Rexam.com 2009) Cans have been reduced to a weight of 33g versus 62g in 1996 (PACSA, 2009) While there are a myriad of options to choose from, these cans are not locally manufactured and would have to be imported.



Rexam, one of the leading global producers and suppliers of beverage cans, commissioned a study by external consultancy Incept. It compared the space efficiency of transporting aluminium cans versus glass bottles, which concluded that slim line cans form 50% less GHG emissions during transportation. (Rexam.com 2009)

In a second study with Brewing Research International, wine in cans was analyzed to see if there was any resulting loss of quality. Results showed that there was no metal taste to the wine and no loss or damage to the flavour or quality. (Rexam.com 2009)



By presenting it to the consumer as a lifestyle option it has numerous applications. Suitable for picnics, outdoor and sporting events, night clubs, airlines, rail networks and mini-bars. Cans are suited for the Grab-and-Go consumer (refer to section 8.4). Still wines are normally packaged in 187ml and 250ml cans, with semi-sparkling wine in 200ml. Wine cocktails are generally sold in 250ml servings. To open a can, no special implements are needed. Pull-tabs, also known as ring pulls that pull off completely were the first type of opening method. These have largely been replaced by stay tabs, that a consumer lifts and pushes back to open leaving the tab intact on the can.

Beverages in cans already have a wide acceptance by consumers in terms of soft drinks and beers. Therefore, this could be the ideal packaging format for producers to attract a new, previously non-wine drinking market.

Cans can be recycled back into new cans, filled and be ready for sale again within 60 days. It is an efficient and relatively cheap package to produce, fill and distribute. In South Africa, a joint venture between Mittal Steel South Africa and beverage can producer Nampak, formed the non-profit company Collect-a-Can. The Collect-a-Can initiative has a 70% recycling rate and has collected 810 000t of metal beverage cans in the past 15 years. (Collect-a-can, 2010)

Who uses it locally and internationally?

Bliss Sparkling wine, sold in Europe. In Germany, the wine-in-cans market is growing in popularity, especially among female consumers. (Kucukaga, S. 2009)

Bottle Green Ltd in partnership with Vinovation International launched a premium range of wine-in-a-can, Wild Pelican. Commercial Director for Vinovation, Caroline Ruijg said "We found a gap in the market for a branded good quality wine with clear branding that comes in a single-serve packaging to fit in with the active lifestyle of today's consumer." (Weekes, C. 2009)

In South Africa, there is a sparkling wine produced locally, called Eve Sparkling. Wine can manufacturer Rexam says that as yet, they have not had enquires from any other South African wine producers.

## **Aluminium Cans**

### **Advantages**

- Single serving
- Can be used for semi-sparkling wines
- No possible 'cork taint'
- Easy to store
- Convenient, compact and lightweight
- Shatterproof
- Protects wine from UV rays
- 100% recyclable packaging
- 360° branding

### **Disadvantages**

- Product cannot be seen
- 12 month shelf life

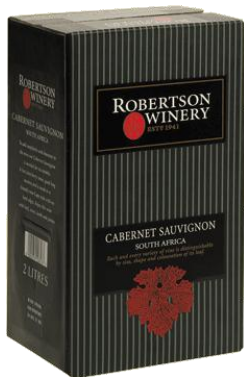
## CHAPTER 7

### CONTEMPORARY PACKAGING ALTERNATIVES: BAG-IN-A-BOX

*“Things do not pass for what they are, but for what they seem.*

*Most things are judged by their jackets.”*

Baltasar Gracian



Bag-in-Box (BIB) wines comprise a strong bladder pack made from food-grade plastic or metallised film filled with wine with a tap encased in a corrugated fiberboard box. (Wapedia, 2009) Sometimes referred to as boxed wine and wine cask. The first commercial BIB was invented in 1955 by William R. Scholle for the transport of battery acid; Scholle Packaging are still producing BIB today. Wine is kept fresh after opening, because the tap system allows wine to be served without allowing oxygen into the bag. They are economical to produce and easy to transport and display in retail outlets.

(About boxed wine – faq, 2009)

In South Africa they are not new on the wine packaging scene. Historically, 5l BIB were available for purchase and were generally used for cheap, entry-level wines. Today, there is a greater selection of package sizes available, with the size of the wine bag inside the box not affecting the quality of the wine. The more recent 3l BIB, also referred to as a ‘fine wine cask’, is expanding the market for better quality, more premium brands. James Reid, Constellation Wines South Africa, agrees that there is an opportunity (albeit limited) for premium and super-premium wines in BIB, especially for white wines (Reid, J. 2009). The 3l box, is seen to complement a range of 750ml and 1.5l glass bottles, as opposed to replacing them. The 18l BIB is predominately used in the hospitality industry and is offered as house wine, by the glass or carafe. (About boxed wine – faq, 2009)

Common sizes and equivalent traditional 750ml bottle sizes:

1l BIB = 1 <sup>1</sup>/<sub>3</sub> bottle

1.5l = 2

$$2l = 2 \frac{2}{3}$$

$$3l = 4$$

$$4l = 5 \frac{1}{3}$$

$$5l = 6 \frac{2}{3}$$

$$18l = 24$$

They are produced to be sold and consumed relatively quickly. Most BIB provide either boxed-on/filled-on or packed-on date. Alternatively boxes may show a use-by or best-by date. Scholle's DuraShield® wine bag and FlexTap® if stored correctly, have a proven shelf life of up to 12 months unopened. Once opened, the wine will stay fresh for up to six weeks. (About Boxed Wine – wineries in the US, 2009)

There is a significant rise in this sector, with more brands and styles available. The growth in popularity can be attributed to certain factors like convenience, better quality of wine in the boxes and improved technology to extend their longevity once opened, with wine remaining fresh for around six weeks. Plus its 'green' image, with boxed wine contributing an estimated 85 – 91% reduction of waste to landfills and 55 - 70% less carbon emissions than the production and shipping of traditional glass bottles of equivalent quantity. It is estimated that up to 70% of Australian wine offered in Australia is in BIB. It is also very popular in Germany and the United States. (Bag-in-a-Box, 2009) Distell offers a number of their brands in BIB in Scandinavia, UK, New Zealand, France and Japan. (Bartis, H. 2009) (About Boxed Wine – wineries in the US, 2009)

An empty 'bag' is supplied to either the producer directly or to a co-filler. Generally, the tap is removed, the bag is filled with wine and the tap re-inserted. A hand-filler machine can fill up to approximately 1 500 bags a day, such as Scholle's TrueFill 900 filler or Scholle's FSF (Form Seal Fill). A dose of Velcorin is added to ensure that boxed wines are free from contaminants, such as bacteria and mould. Used in low doses, it does not affect the colour, nose or taste of a wine, (About Boxed Wine – wineries in the US, 2009)

**Table 10: Production of South African Wine in BIB in litres**

BAG-IN-BOX	CONTAINER SIZE	2004	2006	2007	2008	TREND 2008/2007
	2 litre	9 626 625	7 521 844	7 759 170	7 631 628	98.4
	% of bag-in-box	14.6	12.1	10.6	9.8	
	3 litre	4 774 895	6 426 547	7 831 659	9 231 390	117.9
	% of bag-in-box	7.3	10.4	10.7	11.9	
	5 litre	50 964 411	47 028 925	56 046 510	59 454 020	106.1
	% of bag-in-box	77.5	75.9	76.4	76.7	
	OTHER	391 872	963 437	1 702 771	1 189 622	69.9
	% of bag-in-box	0.6	1.6	2.3	1.5	
	<b>TOTAL</b>	<b>65 757 803</b>	<b>61 940 753</b>	<b>73 340 110</b>	<b>77 506 660</b>	<b>105.7</b>
	<b>As % of total natural wine</b>	<b>23.0</b>	<b>21.7</b>	<b>24.4</b>	<b>25.5</b>	

Source: Adapted from Sawis annual report 2009

Table 10 reflects the production of South African wine packaged in Bag-In-Box. Over the 4 year timeframe of 2004 – 2008, an overall growth can be seen. Interestingly, in international markets more premium brands are being sold in 2l and 3l BIB. In South Africa the 2l BIB figures have fallen over the four years, whilst the 3l figures have almost doubled in 2008 from 2004. There has also been growth in the 5l and other BIB sizes. This increase shows the increasing popularity and convenience of Bag-In-Box wines.

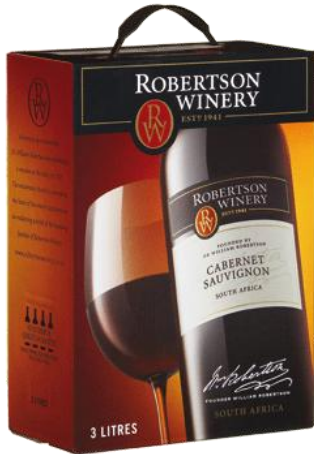
Table 11 shows that the average selling price per litre of boxed wine in South Africa is growing annually, meaning that the price vs. quality ratio is narrowing.

**Table 11: Cost per litre – South African Wine in BIB  
LITRE BAG-IN-BOX (INCLUDING VAT) - NATURAL WINE**

	< R31	> R31
2000	9 %	91 %
2001	10 %	90 %
2002	13 %	87 %
2003	13 %	87 %
2004	6 %	94 %
2005	4 %	96 %
2006	1 %	99 %
2007	1 %	99 %
2008		100 %

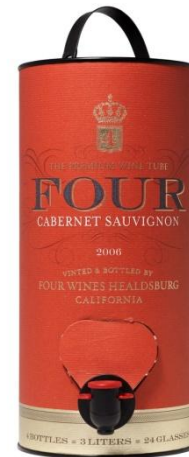
\* Selling prices of wholesalers, private wine cellars and producer cellars.

Source: Sawis annual report 2009



South Africa has a long history with BIB; with the first big name brand, being Cellar Cask, going into box in 1979. (Platter, J. 2009)

Modern versions include more rigid outer packaging and more unusual shapes, like tubes and slim line rectangles.



Sizes range from 2l, 3l and 5l boxes. There is a rise in quality, especially in the U.S. and Canadian markets, with some boxed wine being sold for over \$20 per unit and increased unit sales, with U.S. newspaper *The Record* noting an over 40% growth from 2007 to 2008. Sales of boxed wines are growing significantly, says A.C.Nielson. (Belim, D. 2008)

#### Examples of products in the market place:

In the US, 3-litre boxed wines only account for just over 1% of the wine market, however sales have rocketed in the past year seen by a 44% increase in volume and a 46% increase in value.

Boxed wine is still relatively cheap and the current economic crisis (especially in the US market) could also be a contributing factor to the surge in sales in this sector. (Packaging mag – Wine cartons loved in the US, 2009)

All of South Africa's main export markets have grown in sales of South African boxed wine from 2007 – 2008. There has been a rise in total SA BIB exports from 413 651 937l in 2007 to 484 334l in 2008, which is a significant increase in sales.

51

**Table 12: Exports of South African Wine in BIB**

COUNTRY	2007		2008		TREND 2008/2007	
	BAG-IN-BOX	TOTAL	BAG-IN-BOX	TOTAL	BAG-IN-BOX	TOTAL
UNITED KINGDOM	10 043 433	65 832 338	15 443 019	86 072 993	153.76	130.75
SWEDEN	19 878 859	25 919 814	21 977 305	27 782 239	110.56	107.19
THE NETHERLANDS	829 796	18 709 668	453 750	20 837 390	54.68	111.37
GERMANY	291 498	15 327 456	474 972	15 597 338	162.94	101.76
DENMARK	3 272 440	9 822 411	3 894 381	11 740 626	119.01	119.53
U.S.A.	50 109	9 598 050	71 792	8 472 468	143.27	88.27
CANADA	4 320	7 209 630	47 328	7 608 647	1 095.56	105.53
FINLAND	1 333 815	3 346 642	2 691 834	4 833 200	201.81	144.42
BELGIUM	193 829	4 870 468	326 784	4 806 221	168.59	98.68
REPUBLIC OF IRELAND	53 352	4 722 994	11 170	4 267 383	20.94	90.35
NEW ZEALAND	36 480	642 927	371 496	2 794 542	1 018.36	434.66
AUSTRALIA		648 725		2 353 518		362.79
NIGERIA *	20 280	1 231 395	4 800	2 172 938	23.67	176.46
KENYA	1 370 768	2 187 420	1 139 040	1 777 282	83.10	81.25
JAPAN	26 700	1 245 592	74 988	1 543 538	280.85	123.92
NORWAY	841 298	1 287 403	973 211	1 502 216	115.68	116.69
UNITED ARAB EMIRATES	354 572	899 838	639 025	1 468 698	180.22	163.22
ANGOLA	83 600	363 347	249 132	1 421 036	298.00	391.10
RUSSIA	95 076	1 542 063	133 164	1 254 372	140.06	81.34
TANZANIA	573 508	1 301 082	506 276	1 238 752	88.28	95.21
CHINA	135 132	738 580	90 518	951 784	66.98	128.87
FRANCE	8 100	517 198	42 516	856 655	524.89	165.63
SWITZERLAND	300	1 523 073		829 803	0.00	54.48
POLAND	19 600	842 126	4 600	827 925	23.47	98.31
MAURITIUS *	7 836	558 292	8 956	589 633	114.29	105.61
OTHER COUNTRIES	1 841 236	9 676 630	1 854 277	9 849 317	100.71	101.78
<b>TOTAL</b>	<b>41 365 937</b>	<b>190 565 162</b>	<b>51 484 334</b>	<b>223 450 514</b>	<b>124.46</b>	<b>117.26</b>

\*As from 1 July 2006 all packaged exports to previously exempted African countries and surrounding islands are reflected in full.

SOURCE: DEPARTMENT OF AGRICULTURE, DIRECTORATE FOOD HEALTH AND QUALITY INSURANCE

Accessed Sawis annual report 2009

## **BAG-IN-BOX**

### **Advantages**

- Easy to store
- Once opened wine stays fresh for up to six weeks
- No implements required to open box
- Inexpensive to produce
- Less packaging and lower carbon footprint
- Cardboard component can be fully recycled

### **Disadvantages**

- Connotation with inferior wines
- Not suited for long-term maturation

## CHAPTER 8 PACKAGING ALTERNATIVES: OTHER

*“Modern technology  
Owes ecology  
An apology”*  
Alan M. Eddison

### 8.1 BULK PACKAGING

Bulk transportation and bottling near distribution areas is mainly used when exporting wine by shipping in containerized freight to international markets. It could however, be used in transporting wine from the Cape in large freighted trucks and bottling in Gauteng or Kwa-Zulu Natal etc. Bulk packaging uses less energy and resources per unit volume than any of the alternative options, optimizes space utilization and is very economical.

In essence, a Flexitank is a large version of BIB and is the leading way to transport bulk liquid solutions, such as wine. It consists of a flexible polyethylene ‘bladder’ that is fitted into a standard shipping container. Standard sizes are 16 000l and 24 000l in line with regular shipping containers. For an indication of the quantity a 24 000l Flexitank holds, it equates to 32 000 x 750ml glass bottles that no longer need to be packaged and shipped. At the end port of call, the bulk wine can be filled in lightweight and/or recycled bottles or other AP forms and then be distributed locally. (WRAP – bottling wine, 2009)

Flexitanks are either single- or multi-layered. More economical multi-layered Flexitanks rely on an additional layer of barrier material to protect against oxygen ingress. The first layer consists of polyethylene, which is inert and does not taint the flavour of the product, though it does not offer good barrier protection. Once the two sleeves are joined, there are still pockets of air between and the barrier sleeve could be easily damaged during the container fitting process, which could allow oxygen ingress into the Flexitank. (Scholle A2B, 2009 - news)

There have also been incidents (although rare) of wine taint due to spoilage. Typically, complex organic molecules are detectable in concentrations measured in parts-per-billion. A tiny amount of contaminant could spoil a full consignment of wine. Scrupulous inspection of containers prior to use,

for odours, spillage from previous shipments, wet floors etc. can help minimize the risk. While it is not possible to completely stop any oxygen or taint problems, the rate at which they mitigate depends on the packaging medium selected. (Delen, H. 2009)

Sulphur dioxide acts as a preservative and the amount in a solution is important. Most good quality wines typically have free sulphur levels around 50ppm at the start of transportation. Oxygen molecules that pass through the barrier material are 'captured', says Hank Delen, Global Market Manager for Scholle A2B. Quality is degraded and the sulphur is unable to protect the wine at values at around 12 – 14ppm. He says that the key elements to successful bulk shipping of wine are "The initial free sulphur values, oxygen barrier value of the package and transit time. Temperature is a factor, but due to the large volume of the pack, unless of course you expose the shipping container to extremes for extended periods. It would be typical for the free sulphur levels to be readjusted at destination again, prior to packaging in retail packs." (Delen, H. 2009)

Also popular, though not without disadvantages, is the EVOH (Ethyl Vinyl Alcohol) sleeve. It is sensitive to moisture, which combined with atmospheric moisture and moisture in the Flexitank, decay the oxygen barrier values of it. It is never used in isolation and is always encapsulated with polyethylene. Aluminium foil or metallized films are also used to form an oxygen barrier. Both can flex and move during transit which would degrade the barrier properties. (Scholle A2B, 2009 – news)

Scholle A2B is a large logistics and packaging supplier who has developed the first single-ply Flexitank, a modern advancement on the multi-layer Flexitanks. The single-ply Flexitank, has an integrated oxygen barrier. The barrier functioning properties are inserted into the tough, single layer parent polyethylene material. In addition to a reduction in moisture ingress, the risks connected with taint-causing compounds are also reduced. (Scholle A2B, 2009 - news)

South African producers like Arniston Bay use the VinBulk Flexitank solution by Hillebrand Bulk. In a similar way to the Scholle technology, the VinBulk system is made from a single, strong LLDPE membrane material that incorporates an external barrier to reduce risk of oxygen pick-up and taint. It is made from clear material so you can see the actual loading and release of the wine. Both the Scholle and Hillebrand systems are recyclable, as opposed to other multi-flex options that require the individual layers to be separated prior to recycling. (Hilldenbrandbulk.com, 2009) (Scholle A2B, 2009 – news)

Experienced logistics coordinators are essential to ensure safe, efficient transit of wine, without compromising the wine's quality.



The main complaint with traditional glass packaging has been its weight – leading to a larger carbon footprint during its lifespan, particularly in transportation of wine. Many up market wine brands in South Africa use imported heavy bottles for their premium ranges. These bottles are predominantly shipped from Europe, filled with wine in

South Africa, and then shipped all the way back to Europe to the main export markets.



From this perspective, bulk shipping seems to be an environmentally and hugely cost benefiting exercise. What producers need to guarantee is the safety of the product in transit – regulating temperature control, ensuring no oxygen enters the tank, having reliable bottlers/ fillers at the end destination country. By utilizing the services of bottlers close to the docks, wines can be packaged and distributed without having to travel excess kilometers, saving time, money and energy.

The commercial potential for producers is substantial, as wine transported in bulk can be packaged in any of the traditional or AP mentioned in this report closer to where it is used. Vast quantities can be transported at once.

This may not be a viable option for small boutique wineries where quantities are limited or for super-premium brands, as the possibility of a taint in the wine would affect the entire container load as opposed to individual glass bottle packaging.

At present a lot of South Africa's bulk wine exports are sold on a FOB basis, meaning that the sale occurs once the cargo is on board the vessel; at this stage the cargo becomes the responsibility of the buyer and no longer of the seller. These wines often end up packaged as a 'Buyers Own Brand' in major international supermarkets and outlets. (Delen, H. 2009)

Where wineries are selling a 'brand' it becomes trickier and they would need to sell their wines on a delivered basis. Simon Back, from Backsberg says that they have not opted for this route to date, because like other producers, they don't want to do anything that might ultimately affect the quality of their wines. There is a feeling of 'no control' once the wine is in the container and producers are therefore reliant on external companies to safely bottle their wines. (Back, S. 2009)

In January 2007, Scholle A2B single-ply Flexitanks underwent field tests. Eight x 24 000l containers full of wine were shipped from Australia to the United States and observed throughout the logistics process.

The key data points (Scholle 2007):

- 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)
- 30 day transit time
- Environmental: South Australia: mid-summer with ambient temps up to 42°C  
United States: mid-winter with ambient temps down to 7°C

Pre- and post-delivery samples were evaluated, with a tasting panel unable to tell the samples apart.

Of the Chardonnay tested, some of the results are indicated below:

Alcohol: pre- delivery = 13.48% (v/v) and : post- delivery = 13.50% (v/v)

Total Acid: pre- delivery = 6.19g/l and : post- delivery = 6.02g/l

FSO<sub>2</sub>: pre- delivery = 50.00mg/l and : post- delivery = 34.00mg/l

pH: pre- delivery = 3.46 and : post- delivery = 3.44

Dissolved oxygen: pre- delivery = 0.62mg/l and : post- delivery = 0.95mg/l

(Scholle A2B, 2009 - performance)

**Table 13: Packaged vs. bulk South African Wine exported during 2008 – Litres**

**TYPES OF WINE AND OTHER LIQUOR PRODUCTS EXPORTED DURING 2008 - LITRES**

TYPES OF WINE AND SPIRITS	PACKAGED		BULK		TOTAL LITRES		
	LITRES	AS % OF TOTAL PER VARIETY	LITRES	AS % OF TOTAL PER VARIETY	2008	2007	2006
Chardonnay	17 325 123	58.51	12 286 733	41.49	29 611 856	21 017 738	18 068 237
Sauvignon blanc	15 744 622	79.11	4 157 748	20.89	19 902 370	16 229 875	14 401 714
Chenin blanc	18 557 705	43.06	24 540 187	56.94	43 097 892	39 294 521	34 881 283
Other white wine	40 075 166	49.49	40 900 447	50.51	80 975 613	50 294 872	48 511 075
Blanc de Noir & Rosé	13 603 476	55.53	10 893 197	44.47	24 496 673	18 388 602	16 341 097
Cabernet Sauvignon	14 232 672	65.99	7 334 053	34.01	21 566 725	19 331 346	14 972 953
Shiraz	17 864 740	83.62	3 499 330	16.38	21 364 070	16 836 590	12 796 905
Pinotage	9 616 178	54.62	7 988 903	45.38	17 605 081	17 203 507	13 976 232
Merlot	8 531 597	76.58	2 609 460	23.42	11 141 057	9 109 697	8 543 387
Other red wine	67 899 219	49.34	69 717 409	50.66	137 616 628	101 648 809	86 673 623
<b>Subtotal natural wine</b>	<b>223 450 498</b>	<b>54.85</b>	<b>183 927 467</b>	<b>45.15</b>	<b>407 377 965</b>	<b>309 355 557</b>	<b>269 166 506</b>
Fortified wine	378 927	89.54	44 280	10.46	423 207	405 696	486 547
Sparkling wine	3 952 009	100.00	-	-	3 952 009	2 779 364	2 018 235
<b>Total wine</b>	<b>227 781 434</b>	<b>55.32</b>	<b>183 971 747</b>	<b>44.68</b>	<b>411 753 181</b>	<b>312 540 617</b>	<b>271 671 288</b>

SOURCE: DEPARTMENT OF AGRICULTURE, DIRECTORATE FOOD SAFETY AND QUALITY ASSURANCE

Source: Sawis annual report 2009

The United Kingdom imports more than a billion litres of wine each year, with close to half coming from New World producers. Whilst most of this wine is filled in green glass 750ml bottles in the country of origin and then exported, over 210 million litres of wine are currently shipped in bulk by flexi tanks and ISO tanks, annually to the UK.

South African wine exports in litres in 2008 were over 400 000 000 (SAWIS), with 45% of that total being natural wine shipped in bulk. This is a significant portion of South Africa's wine exports. Considering the UK is by far the largest importer of South African wines, it is a natural assumption that bulk shipping to export markets, and to the UK in particular, are set to increase in the future.

Bulk exporting results in a lower carbon footprint, plus lower shipping and distribution costs. This benefits the environment, saves money for the retailers who can in turn retail the product at a competitive price, saving the consumer money too.

After the success of the WRAP and GlassRite Wine project (refer to Chapter 3), WRAP is working on an 18-month project, encouraging the bulk importation of wine to the UK and in conjunction with international partners the production of lightweight bottles. South Africa is one of the countries taking part in the study. (WRAP “Bottling wine”)

## **BULK SHIPPING**

### **Advantages**

- Cost effective
- Vastly reduced carbon footprint
- Longer shelf-life in the retail supply chain

### **Disadvantages**

- Lack of control for producers when bottling, ensuring final quality
- Equipment needed to ensure safety of contents
- Only suited to large wine quantities
- Job losses at local packaging suppliers and bottlers, negative effect on the economy

## **8.2 BLADDER PACKS, FOILS & PLASTIC CONTAINERS**

Bladder packs are the bags filled with wine, similar to the foil bags sold in Bag-in-Box format. Bladder packs can come in a wide variety of sizes from 1l to 1000l. They are also used by the hospitality industry to buy wine in bulk, to sell as wines by the glass. Also sold in loose packs mainly for bulk, cheap wine.



In South Africa, this form of packaging has been banned. Known locally as 'papsak', these packs contained inferior wine that was very cheap to purchase. It led to widespread alcohol abuse, particularly among low income groups in the wine growing regions of the Western Cape, where it was widely available.

The South African wine industry instigated the ban in 2004 which was gazetted on 14 September 2007. Amendments to the Regulations of the Liquor Products Act, 60 of 1989, now specify that alcohol destined to be consumed by the public must be sold in self-supporting containers. (Sapa, 2007)

With the ban of the traditional low cost "papsak", cheap wine is also sold in 2 and 5 litre PET containers. Wine in these containers is meant for consumption after purchase and not for long term storage. Containers used include, clear PET bottles similar to 5 litre water bottles and white opaque-looking HDPE (high density polyethylene) containers. These are mainly used by large producers and co-ops, with the target market being for local consumption. Shelf life is limited, up to three months as neither container includes any oxygen scavenging ingredients.

## **BLADDER PACKS, FOILS & PLASTIC CONTAINERS**

### **Advantages**

- Cheap to produce
- Low carbon footprint
- Suitable for use in hospitality industry
- Easy to chill

### **Disadvantages**

- Negative connotation in South Africa, 'Papsak'
- Not easy to handle and pour (bladder packs and foils)

- Not suitable for medium or long-term storage

### 8.3 POUCHES



Astrapouch, a wine pouch developed in South Africa, made from three layers that combine strength, permeability and aesthetic appeal. The pouch has a nine month shelf life. South Africa's Arniston Bay pouches come in an easy-to-carry 1.5-litre package, which holds twice the amount of a regular 750ml bottle at a great reduction in equivalent weight, and a 2l. Both are sealed with a Crono press tap. A handy 250ml pouch is easier to carry to outdoor lifestyle events and also is convenient for the hospitality and airline industries. However, it is not biodegradable, but does take up minimal landfill space, taking up 90% less landfill than glass, and it has 80% less of a carbon footprint than glass. (Arniston Bay – our environment, 2009)

The innovative eco-friendly Arniston Bay pouch has broad market appeal, says Jason Godley, Category Manager Wine at UK retailer, Tesco. He adds that as retailers, they have demanding targets to reduce packaging waste and their overall carbon footprint, “the Arniston Bay pouch is a great example of the innovation we need from our suppliers to contribute to meeting these targets.” (Arniston Bay – our environment, 2009). Versus, produced by The Company of Wine People, is also available in pouches.

PIRA Testing, an international testing and technical consulting service company, specializing in testing relating to content, packaging, printing and paper, conducted a life cycle analysis (LCA) on all stages of the packaging of wines from South Africa and Australia sold in the UK. Raw material extraction, transport, packaging manufacture, filling, disposal and recycling were analyzed. The analysis measured the wastes generated, energy used, emissions released and other impacts on the environment of the Arniston Bay pouch. PIRA testing reveals that cube utilization is one of the main

contributing factors to reducing transport costs and achieving optimum performance in the distribution supply chain. It was revealed that the pouch has 80% less carbon footprint from the beginning of its lifecycle to the end, as opposed to a traditional heavy weight bottle. (Arniston Bay – our environment, 2009)

Other South African wine brands available in a pouch include Sediba, a Distell branded wine packaged in a 1.5l pouch for sale in Finland. DGB has just launched its Douglas Green pouch into the American market.

## **WINE POUCH**

### **Advantages**

- Convenient
- Low carbon footprint
- Suitable for active lifestyles
- Shatterproof

### **Disadvantages**

- Not biodegradable
- Not suitable for medium or long-term storage

## **8.4 GRAB-AND-GO CONVENIENCE**

Grab-and-go relates to changing drinking habits that fit in with today's modern lifestyle. Wines in smaller single servings are becoming increasingly popular. Formats include wine in glass bottles, cans, cartons and more recently pouches. Besides being available to purchase at retail outlets, this form of packaging is highly suited for airlines and (excluding glass) for outdoor events where wine was normally not available in the past, such as sporting events and concerts.

Wine Cube 4-Pack was launched in the US in 2006. Four x 250ml wine cartons are each filled with a different wine. The set of two whites and 2 reds are sold as a 1l pack that contains the individual servings. Each 250ml serving equates to two glasses of wine, which is just enough for a couple to enjoy a glass of wine with their dinner without needing to open an entire bottle. Also suited to larger gatherings, where people may not necessarily like the same style of wines, this idea caters to all tastes. (Pressroom.target.com, 2006)

Recently launched in California are single-serve pouches aimed at the premium wine market. The eco-friendly packaging comes with a tamper proof push-pull spout. Access Beverage Inc. President, Diane Svehlak said, "Changing consumer lifestyles are pushing retailers to carry more single-serve alcoholic beverages without sacrificing top-shelf quality or brand names". (Reuters.com, 2009)



Grab-and-Go Convenience packaged wines relate to lifestyle needs. They are easy to carry, open and serve. Single serve wines are ideal for in-room bars in hotels and for home use. AP single serves are used on airlines for the lighter weight and for security factors. Six-pack single serve 250ml bottles have been introduced by Arniston Bay. (Arniston Bay – our environment, 2009). In 2006 Hardy's (before its amalgamation into Constellation wines), introduced a 187ml single-serve acrylic wine bottle that was sealed by a twist-top wine glass. (Carter, F. 2006) Wolf Blass Green label produces 187ml PET Bordeaux-style bottle packaging for their range with lower GHG emissions. (Packagingmag.com – 'Wolf Blass, 2009)

## GRAB-AND-GO CONVENIENCE

### Advantages

- Convenient
- Suitable for active lifestyles
- Broad marketing appeal
- Ideal for one person or single servings

### Disadvantages

- Not suitable for medium or long-term storage

## **PART III**

## CHAPTER 9 CONCLUSION AND RECOMMENDATIONS

*“We never know the worth of water till the well is dry.”*

Thomas Fuller, Gnomologica, 1732

### 9.1 CONCLUSION

Not too many years ago, the screwcap was shunned and perceived as an untraditional and inferior, yet it has rapidly gained acceptance amongst most consumers and retailers. Similarly, wines in alternative packaging are likely to gain gradual consumer approval and acceptance which in turn shall boost the extent to which it is used. Whether the quality of the actual wine inside the packaging will move beyond entry level will be determined by consumer demand, retailers and ultimately producers.

Drinking habits have inevitably changed with modern lifestyles and wine has become an everyday drink, rather than occasional. Environmental awareness and eco-friendly options have become a priority in consumer purchasing decisions. Alternative wine packaging contributes significantly to these needs and offers viable and convenient choices that appeal to all consumer segments.

Beyond the traditional glass bottle, PET bottles, cartons, bag-in-a-box and pouches all share common benefits:

- Convenient
- Less chance of spoilage, i.e. cork taint
- Greater value: 1l + vs. 750ml wine
- Easier and greater recyclability
- Lighter, therefore smaller carbon footprint in transport
- Shatterproof
- Less negative effects of light
- Portable
- Suited to active alfresco lifestyles: transport to picnics, sporting and recreational events
- No special implements are required to open them

The main barrier is consumer resistance and the perception of inferior quality wine products inside AP. James Reid, Vice President – General Manager Constellation Wines South Africa, points out that

whilst consumers are concerned with environmental issues, price is still a higher priority in the wine purchasing decision. (Reid, J. 2009)

Most wine producers and distributors in South Africa are open to AP. In order of preference, most agreed that at present or in the immediate future that they would consider:

- bulk shipping in Flexitanks
- lightweight and recycled bottles and wine cartons

There was more resistance to PET, cans and pouches as they are still relatively new on the scene and still require further trials in the market place.

Heidi Bartis, Distell's Communications Manager, surmises "There was a more immediate acceptance of screwcap closures, for example in the UK, Australia and New Zealand, than locally. In some instances, we have offered wines under cork in the local market that are sold under screwcap offshore. However, this is changing and local consumers have become far more accommodating of screwcaps. Based on this assumption, we do believe local wine drinkers will accept alternatives but it will take longer. Change is always initially embraced by those consumers with a high level of involvement in wine, but for those who are looking for an easy-drinking, uncomplicated beverage, there are still traditional quality cues that are difficult to dislodge when you come to the market with alternatives." (Bartis, H. 2009)

## **9.2 RECOMMENDATIONS**

### **PRODUCERS**

- Should not limit themselves to using certain AP for only entry-level or inferior wines. Similarly, the integrity of quality of each AP should be considered, especially the suitability of each for every individual product.
- Super-premium brands, limited quantity wines (that are not suited for bulk shipping) and wines that require long-term maturation are suited to glass bottles. Glass is inert and is taint free and can still be regarded as the most popular means of wine packaging for most types of wine.
- Producers should attempt to use lightweight bottles, re-use existing glass bottles and/or recycled glass.
- The same principal applies to fortified wines and to sparkling wine.
- As lightweighting bottle advancements are made, reduction to bottle weight of sparkling wines is viable, whilst still ensuring the safety and integrity of the product. Semi-sparkling wines that do not require further bottle development could be packaged in single-serve aluminium cans.

- Dessert wines traditionally packaged in clear glass can be packaged in lighter weight and re-used bottles. As clear glass is the easiest of the glass colours to recycle, recycled clear wine bottles could effectively be applied to sweet wines.
- Ready-to-drink off-dry and semi-sweet wines that are often bottled in amber-coloured glass, could easily be bottled in clear re-used/recycled and/or lightweighted glass.
- Large quantities of natural wines destined for export could be transported in bulk and bottled at destination preferably in recycled/re-used lightweight bottles or in alternative packagings such as Tetra Pak cartons, PET bottles, Bag-in-a-Box and Pouches etc. Careful consideration should be given to the possibility of job losses at bottlers and packaging suppliers in South Africa, if wine is exported in bulk, however.
- Innovative designs have made alternative packaging an ideal platform for branding, with opportunities for 360° branding in packaging such as Tetra Pak cartons and Bag-in-a-Box. This is especially suited to aluminium cans that have a myriad of branding possibilities and can be used as a vehicle to attract a new wine drinking audience.
- Retailers have surmised that the quality of wines in alternative packaging needs to increase. Historically wines, particularly Bag-in-a-Box, have endured a reputation of being of entry-level, poor quality wine. There is a wide spectrum of modern shapes (e.g. 2l tubes), that together with quality wines, clever branding and marketing could lift this negative image.
- With over R4 billion spent on South African wine packaging annually (Carter, M. 2009) and considering in 2008 over 50% of South Africa's wine production was exported, the onus is on producers to find ways to reduce packaging and ultimately their carbon footprint.

## **CONSUMERS**

- Consumers need to be better educated to elevate awareness of recycling of packaging.
- Only 25% of South Africa's glass bottles are actually being recycled, with the balance ending up in landfill. Ultimately consumers need to make a concerted effort to recycle products.
- Consumers need to demand products that have a lighter carbon footprint and avoid purchasing products with excessive packaging, where possible.
- Consumers need to purchase products in re-used, lightweight and recycled glass. This includes products that can be fully recycled or that have a large component that can be recycled.

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**WINE PACKAGING: AN ALTERNATIVE TO TRADITIONAL GLASS**

Lyn Woodward CWM student

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\*AP: Alternate Packaging, refers to wines packaged in Bag-in-Box,  
TetraPak Cartons, PET bottles, cans etc.

**NAME:**

**COMPANY:**

**POSITION:**

Questionnaire - please answer all questions

1	Do you believe today's WINE consumers are concerned with "green issues", such as carbon footprint, sustainability?	YES/NO
	Comments:	
2	Internationally especially the UK wine market, retailers are demanding 'green' packaging. To retain your place in this INTERNATIONAL market, would you consider distributing wine in any of the following packaging options?	Now, Never or Future
2.1	- Shipping wine in bulk in flexitanks and packaging at destination?	
2.2	- lightweight wine bottles?	
2.3	- recycled wine bottles?	
2.4	- recycled PET bottles, shaped and styled to image traditional glass bottles?	
2.5	- recycled PET bottles, in a non-traditional bottle shape?	
2.6	- TetraPak/ wine Cartons?	
2.7	- Bag-in-a-box?	
2.8	- Cans?	
2.9	- Other: pouches etc.?	
	Comments:	
3	Locally, the <u>SOUTH AFRICAN MARKET</u> is slower to more readily accept 'green' wine packaging. Locally, would you consider distributing wine in any of the following packaging options:	Now, Never or Future
3.1	- Shipping wine in bulk in flexitanks and packaging at destination?	
3.2	- lightweight wine bottles?	
3.3	- recycled wine bottles?	
3.4	- 100% recycled PET bottles, shaped and styled to image traditional glass bottles?	
3.5	- 100% recycled PET bottles, in a non-traditional bottle shape?	
3.6	- TetraPak/ wine Cartons?	
3.7	- Bag-in-a-box?	
3.8	- Cans?	
3.9	- Other: pouches etc.?	
	Comments:	
4	Do you perceive AP* wines as to suitable only to certain target markets? If yes, please comment:	YES/NO
5	Wine in AP* has historically been of medium-low quality and priced at	Yes / No

	reasonable price points, do you believe there is a market for more premium brands in AP?	
	If yes, in what sort of AP?	
	If yes, what style of wine?	
	Additional comments:	
6	As a wine <b>CONSUMER</b> , would you personally purchase wine in any of the following?	Yes / No
6.1	A light-weight bottle, resembling a traditional wine bottle? - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc?	
6.2	<u>Wine-in-a-box</u> - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc?	
6.3	Wine in a <u>Carton</u> , e.g. TetraPak - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc?	
6.4	Wine in a <u>PET plastic bottle</u> - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc?	
6.5	Wine in a <u>pouch (e.g. similar in appearance to packages of fresh soup and sauces available at large supermarkets)</u> - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc?	
6.6	Wine in a <u>Can or single-serve-pouch/carton?</u> - for daily consumption at home? - for parties work/at home? - to take to the beach, picnic etc	
7.	A question of wine's longevity in AP* exists, would you purchase any of the following alternatively packaged wines?	Yes / No
7.1	- white and blush wines intended for early drinking?	
7.2	- white wines, oaked, aged and ready for consumption?	
7.3	- red wines for cheap and cheerful drinking?	
7.4	- red wine, fully matured and ready for drinking?	
7.5	- red wine, young and in need of maturation?	

Any additional comments you would like to about Alternative Wine Packaging:  
In regards to the international wine market?  
In regards to the local market?  
Thank you for your time and effort in completing this questionnaire.