



Label bubbling - Information sheet

Prepared By: Wine Packagers of Australia

Date of Issue: 14 May 2019

About the WPA

In January 2013, several leading contract wine packaging companies joined forces to form Wine Packagers of Australia (WPA).

As individual contract packagers, we recognise the need to use our combined knowledge and expertise in the packaging of wine to assess and study dry good and packaging performances experienced across our businesses.

We meet quarterly to discuss manufacturing capability issues, innovations in packaging and packaging equipment, legal compliance issues, supplier performance, and related industry changes.

With an accumulated 162 years in the contract packaging industry, our knowledge of wine packaging is unparalleled.

Label Application

As contract packagers we are the last link in the supply chain – and when the label doesn't meet the expectations of the customer it seems that application is the strong suspect.

We are involved with many trouble-shooting investigations where we scrutinise the suitability and performance of dry goods on our members' automated bottling lines. When label application issues arise, we can recognise very quickly whether the fault has been through application error or if other factors have contributed.

This WPA paper contains information on what can influence and contribute to label bubbling, lifting and frilling.

Open Weave Paper Stocks

Many customers would like their product to perform well when exposed to refrigeration and ice buckets.

WPA quality team members have conducted many tests on open weave paper using the steam stress test to determine how uncoated paper stocks perform under humid conditions. This involves holding bottles directly over boiling water and stressing the label to steam for 10 seconds.

Due to the unique characteristics of open weave papers, bubbling/lifting can occur particularly

The Secretariat
Wine Packagers of Australia
PO Box 345 Angaston SA 5353
E: secretary@wpa.org.au
T: 0447 200 025



Label bubbling - Information sheet

with larger area labels. The use of over-varnish is recommended to boost surface water repellence and to minimise the opportunities of label distortion when exposed to high humidity/moisture during filling, labelling, storage or refrigeration. Fasson recommend a varnish designed to achieve a target COBB* value of 1 gram or less for a robust product. They also recommend that you speak with your designer/printer for selection of correct varnish. *COBB Value: weight (grams) of water absorbed per square metre (m²) of label area.

Some manufacturers supply labels with a polymer layer as a barrier to also help reduce bubbling for wines that are refrigerated. Thorough testing through the bottling line is recommended prior to use.

Foiling, Embossing, or Debossing (reversed embossing)

These embellishments greatly reduce the surface area of the label contacting the glass and will reduce the effectiveness of the adhesive as they can distort the paper fibre and can reduce adhesion to the glass bottle, resulting in moisture permeating from between the glass and into the label. This lifting can be delayed in time and not evident immediately during or after bottling. Thorough review of the label's embellishments should be undertaken by your contract packager.

Glass sink and bulge

The labeling equipment used by our members are industry standard machines operated in a commercial environment where best practice is used to apply labels to bottles with a diverse range of sink and bulge. It is therefore imperative that label stock is chosen fit for purpose and resilient.

Small imperfections in the surface of the bottles, such as sink or bulges in the label panel, can result in the label not making perfect contact with the glass. If moisture penetrates into the label, the paper fibers expand and will lift at the points of weakest bonding to the glass, such as areas where there is sink or bulge.

If your contract packager believes the bottle is the source of bubbling and lifting labels, they have access to state-of-the-art Exascan equipment to measure the dimensions of the bottle's label panel or the encroachment of the heel and shoulder radius on the label panel edges.

Attached for information is the article:

- Help! My wine labels have bubbled *Asia Pacific Packaging 2004*

Summary

As a contract packagers we use our combined knowledge and expertise in our given fields to set benchmark tests and specifications that provide our customers and their designers with the tools and information they need to make the best label decisions for their brands. A

The Secretariat
Wine Packagers of Australia
PO Box 345 Angaston SA 5353
E: secretary@wpa.org.au
T: 0447 200 025



Label bubbling - Information sheet

copy of the label pdf (see example attached) containing information on paper stock, adhesive, label embellishments (embossing, graining, varnish/high build), roll direction, core size and dimension detail as well as label samples is welcomed by your contract packager well before the bottling date.

Across our businesses we are experiencing an increase in the use of open weave paper stock and labels being manufactured overseas for application in Australia. These have shown a susceptibility to bubbling.

Our members do not warrant or guarantee successful or long-term adhesion of labels that have not been designed using the information contained in this Information Sheet and referring to the *Getting Ready for Bottling Pressure Sensitive Label Guide* which can be downloaded from <https://wpa.org.au/supplier-specifications/> or <https://sizemeup.com.au/resources/>

We hope this information sheet is of use to you in choosing the correct paper stock for your labels.

Help! My wine labels have bubbled...

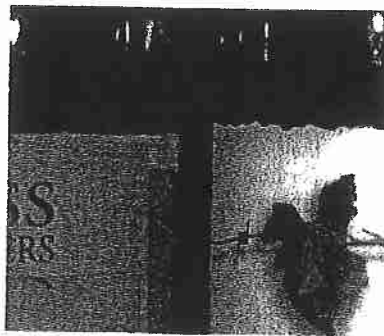
Sometimes it's hard to keep those bubbles inside the bottle where they belong! Here's a common issue that many printers will have experienced because of the shift to uncoated papers by wine label designers. The NPL investigates

A well-known SA printer was having problems with bubbling wine labels using a locally produced paper label stock. The labels were supplied to his client for application to bottles of Shiraz Cabernet, but the filling and labelling was actually done by a contract bottle filler. After several months, the customer complained of the bubbling of his labels, so the printer asked the National Printing Laboratory to investigate the cause of the failure.

Shortly thereafter, we received a box containing four filled and labelled bottles of Shiraz Cabernet, each one exhibiting the label failure in question. The bubbling appeared to involve the majority of this particular labelling job, rather than isolated instances throughout the run. That meant we had no good and bad samples for comparative testing. We therefore proposed to check the bottle surface profile and generally investigate the mode of failure.

To carry out testing for initial tack and peel strength against the supplier's basic specification of the substrate, we would naturally have needed unprinted label stock - but there were no extra labels lurking in the box. However, we did not believe that this was the cause of the problem anyway, as the failure was typical of that seen in several recent complaints from the wine label industry.

Where bubbling occurs, the label can usually be pressed to re-adhere to the glass, but it eventually develops the same failure. In this case, removal of part of the label by careful cutting at the bubble showed that the adhesive was still present on the label and could be easily activated by pressure. There was no indication of any poor adhesive stock manufacture - in fact, the bubbling occurred at areas of no



Unstable label: bubbles belong on the inside

contact between label and bottle surface.

After the samples had been kept in the NPL laboratory for several days, at the standardised paper industry conditions of 23 degrees Celsius and 50 per cent RH, most of the bubbles had reduced or disappeared. In fact, only one of the samples showed sufficient bubbling to carry out worthwhile bottle profile testing. Placing this labelled bottle in an incubator, at 38 degrees Celsius and 90 per cent RH, quickly showed up the poor contact between bottle surface and label.

The major bottle profile relating to label application is termed 'the bulge' or 'sink' along the vertical face of the label panel. So, we removed the worst front and back labels after carefully marking on the bottle both the position of the label and the position of the bubbling. The maximum gap between a steel ruler and the bottle surface was determined with a feeler gauge.

Here's the interesting part: the tested bottle showed a maximum sink in the glass surface of 0.33mm, corresponding to the worst bubbling on the label. To really make sure, we also inked up the bottle surface and then printed it onto board. This imaging clearly shows that a major

sinkhole existed exactly where the bubbling of the label occurred.

The bottle manufacturer's process capabilities for bulge and sink were a maximum of 0.1mm per 25mm of label height. With a 100mm label, this translated to 0.4mm. The actual measured bottle was inside this tolerance, but the dimensions of the label and its relative stiffness made it virtually impossible for the label to distort sufficiently to remain adhered to the sinks on the bottle surface.

Their poor appearance was made worse when the labels allowed moisture to penetrate through the label, and the paper became distorted at these areas.

This issue is proving difficult for the industry to solve. The wide use of pressure sensitive adhesives (instead of wet glue labels), and the growing use of uncoated papers have certainly increased the incidence of complaints. Even bottles within manufacturers' tolerances still give rise to bubbling.

In the absence of an ability to improve the bottle profiles, printers can try the following approaches:

- Use non-absorbent label stock. The label will bridge the bottle sinks and will then not distort with moisture uptake. However, this solution will still cause problems at the label edges where bulges rather than sinks are involved.
- Use a label stock that permanently distorts to match the bottle profile, and the residual stresses caused by the deformation strain are less than the adhesive holding power. This could be pursued in several ways:
 1. A soft, distortable label stock.
 2. A label stock that can be distorted under certain conditions, for instance a paper label that distorts under moisture absorption. If this could be applied in a damp condition, it would then dry to the distorted bottle surface shape without the development of voids. Further moisture will then have no effect.
 3. A relatively thick, soft adhesive, possibly a foam, that would take up the sinks and bulges of the bottle surface. It would need to be about 0.6mm thick. □



p: (08) 8405 0500 f: (08) 8405 0560
 e: art.adelaide@mcclabel.com FORM NO: CSF 28202

CLIENT: Vinpac International	DATE: 12-Jul-16 01:34:05
DESCRIPTION: Vinpac Tier	VINTAGE: 2013
VARIETY: Chardonnay	CONTENTS SIZE: 750mL
COUNTRY: Domestic	LABEL TYPE: Back
PAPER: KillerWhite Gen3 PE S2030 PET30	OPERATOR: graham.pankhurst
COLLOART REFERENCE: A06643	STOCKCODE: VINPVINCY13DM7B

PRINT SEQUENCE			
1	Green 582	45°	200# 1.01%
2	Grey 8401	45°	200# 3.25%
3	Black	45°	200# 8.14%
4	Matt Varnish	45°	200# 99.99%
5	Screen Highbuild 125W	45°	200# 0.44%
6	Grain	45°	200# 74.58%
7	NIS5110 Die	45°	200# 0.87%



TBA
80.0 mm

VINPAC

The Barossa is famous for rich, full-flavoured wines with opulent fruit flavours. The Krondorf philosophy is simple; select the best fruit, from the best vineyards, tended by the Barossa and Eden Valley's best growers. This beautifully balanced wine presents rich melon flavours with hints of citrus. It is ready to enjoy now.

BAROSSA

2013 CHARDONNAY

Vinpac International Stockwell Road, Angaston SA 5253	750 mL	
CONTAINS SULPHITES. PRODUCED WITH THE AID OF MILK PRODUCTS. TRACES MAY REMAIN. WINE OF AUSTRALIA XX.X% ALC/VOL		
	Standard Drinks 	

VINPVINCY13DM7B

THIS PROOF IS FOR YOUR GENERAL APPROVAL. PLEASE CHECK THOROUGHLY AS THE RESPONSIBILITY FOR ITS ACCURACY RESTS WITH YOU. PLEASE CHECK ALL COPY, LEGAL STANDARDS AND SIGN AND DATE YOUR APPROVAL FOR PRINT. ALL MANDATORY REQUIREMENTS CAN BE SOURCED FROM THE AWBC PH: 8228 2000.

APPROVED BY: **DATE:**