Pressure Sensitive Label Forum

WINE PACKAGERS
OF AUSTRALIA

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Good Morning and welcome to the first forum held by Wine Packagers of Australia.

Pressure Sensitive Label Forum

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The WPA was formed in January 2013 the founding members are

Ozpak (Namgambie),
Portavin (Sydney ,Perth. Melb and Adelaide)
Prowine Gawler
Hunter Bottling (Pokolbin),
Barossa Bottling (Nuriootpa),
Torresans (McLaren Vale),
Mclaren Vale Bottling (Serafino Mclaren Vale),
Best Bottlers (Mildura) and
Vinpac International (Angaston & McLaren Vale).

INTRO >

Mission Statement

Providing collective knowledge and solutions to our customers.

WINE PACKAGERS
OF AUSTRALIA

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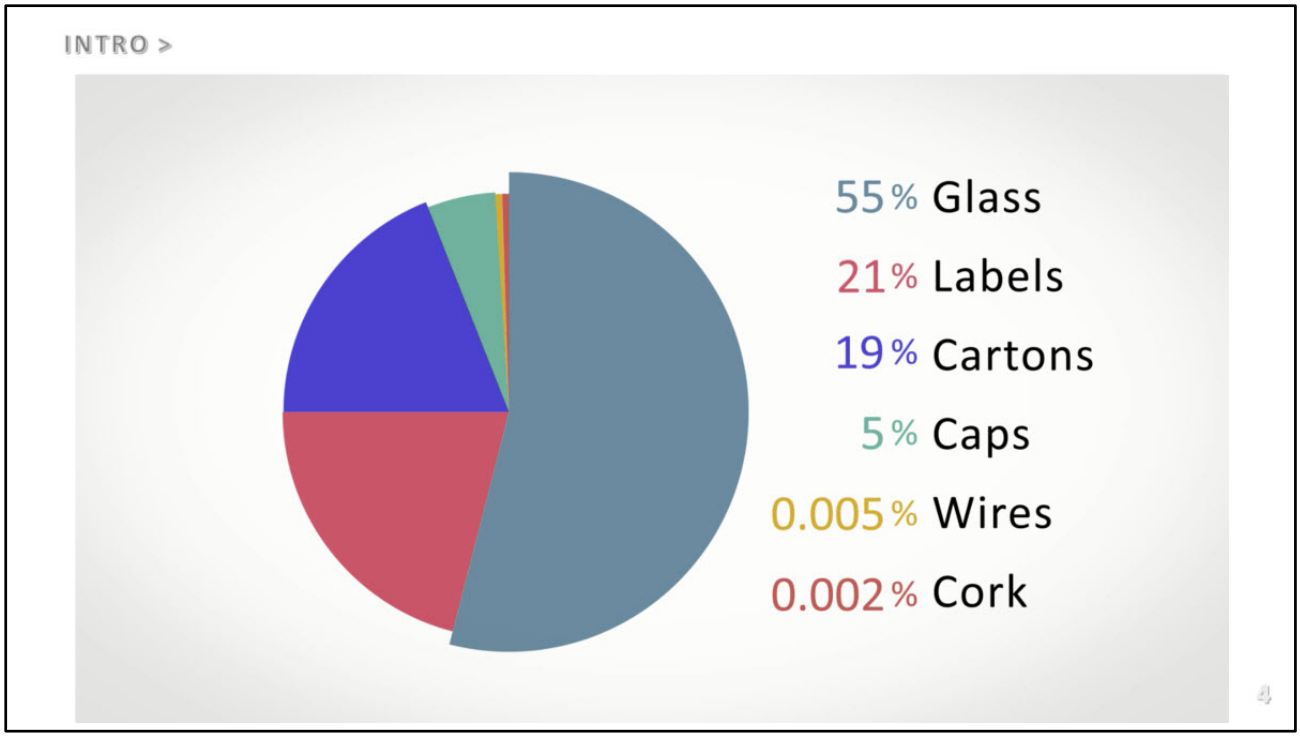
We formed Wine Packagers of Australia (WPA) with the sole purpose to better service our wine industry by providing collective knowledge and solutions.



We meet quarterly discussing our individual packaging problems as well as manufacturing capability issues within our businesses.

From these meetings we identified a number of common problems (as shown behind me on the screen).

We collate all production problems into one data base and we believe this makes our industry more coherent. Also, this has allowed us to produce Industry Guidelines for manufacturers/suppliers/customers.

From these Industry Guidelines each of us will produce our own set of Specifications with capability tolerances and expectations individual to our business.

Today is about using our collective knowledge and expertise to overcome some common problems and agree on industry standards that continually improve Australia's wine packaging.

The members of the WPA believe we all want to be better at what we do.

The first presenter needs little introduction to many of you.

Peter Ridings is a legend in the wine packaging area and I will now hand over to Peter for the first agenda item - Glass coatings.

WINE BOTTLES
in the Supply Chain

Presentation by

Peter Ridings
QA Facilitator
Vinpac International

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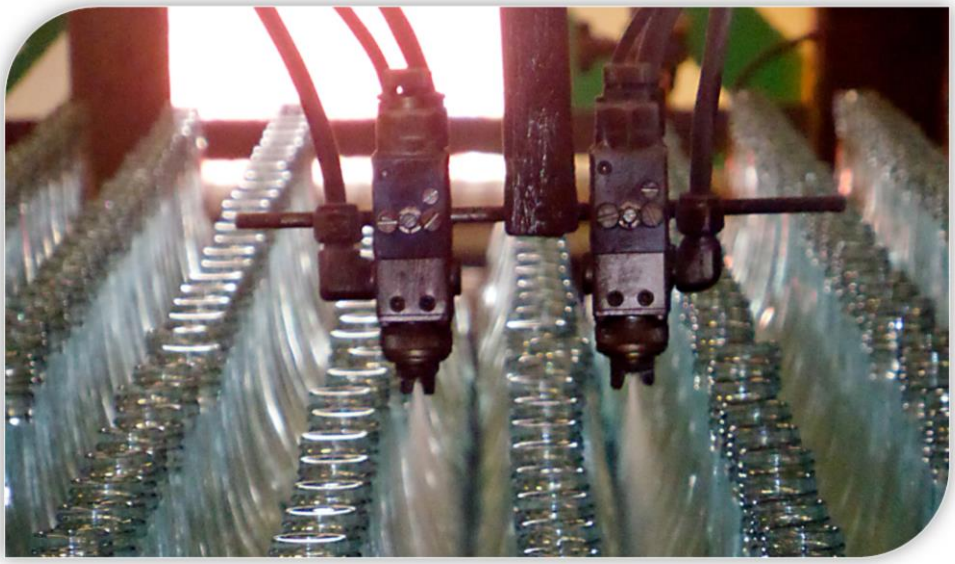
BOTTLE > Glass Treatments

Cold End Coating



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The surface coating of newly formed wine bottles provides surface protection and lubricity during the storage and transport of glass as well as during the bottling process.

If no coating is applied surface damage will occur and result in a weakening of the wine bottle.

There are two types of coating:

- tin oxide is applied immediately after forming of bottle (hot end)
- polyethylene is sprayed onto the surface of bottles exiting from the annealing lehr (cold end)

The cold end treatment, Duracoate, an aqueous polyethylene emulsion, is the subject today.

The polyethylene is diluted with water and applied by an automated overhead sprays where the jets or nozzles pass between the rows of glass spraying solution on the shoulder of the bottles.

BOTTLE > Glass Treatments

Cold End Coating
'scuffed bottles'

Cold End Coating
'adhesion difficulties'

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Too little surface coating will result in the scuffing of bottles.

Too much coating will result in wine labels not fully adhering and lifting away from the glass surface. This is more evident under extreme weather conditions of high dew point and excessive humidity.

Irregular coating also creates an undesirable visual impact.

Question to the panel:

How do you as manufacturers of bottles control the application of cold end treatment and what is the current method of testing?

Today we will discuss a few studies conducted at Vinpac to measure the dimensions of wine bottles.

Specifically the sink and bulge associated with the label panel region and the encroachment of the heel and shoulder radius on the label panel edges.

BOTTLE > Sink & Bulge

3D scanner for the bottle's surface

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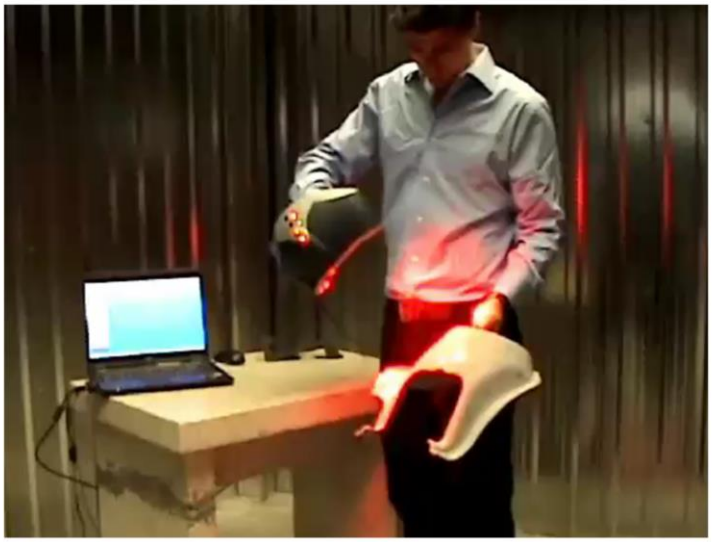
The equipment we use is a handheld 3D laser scanner called the Exascan.

It is manufactured by Creaform and utilises a laser cross and two detection cameras to accurately and reproducibly map 3 dimensional objects.

Our measured accuracy of the device is about half the thickness of a human hair.

BOTTLE > Sink & Bulge



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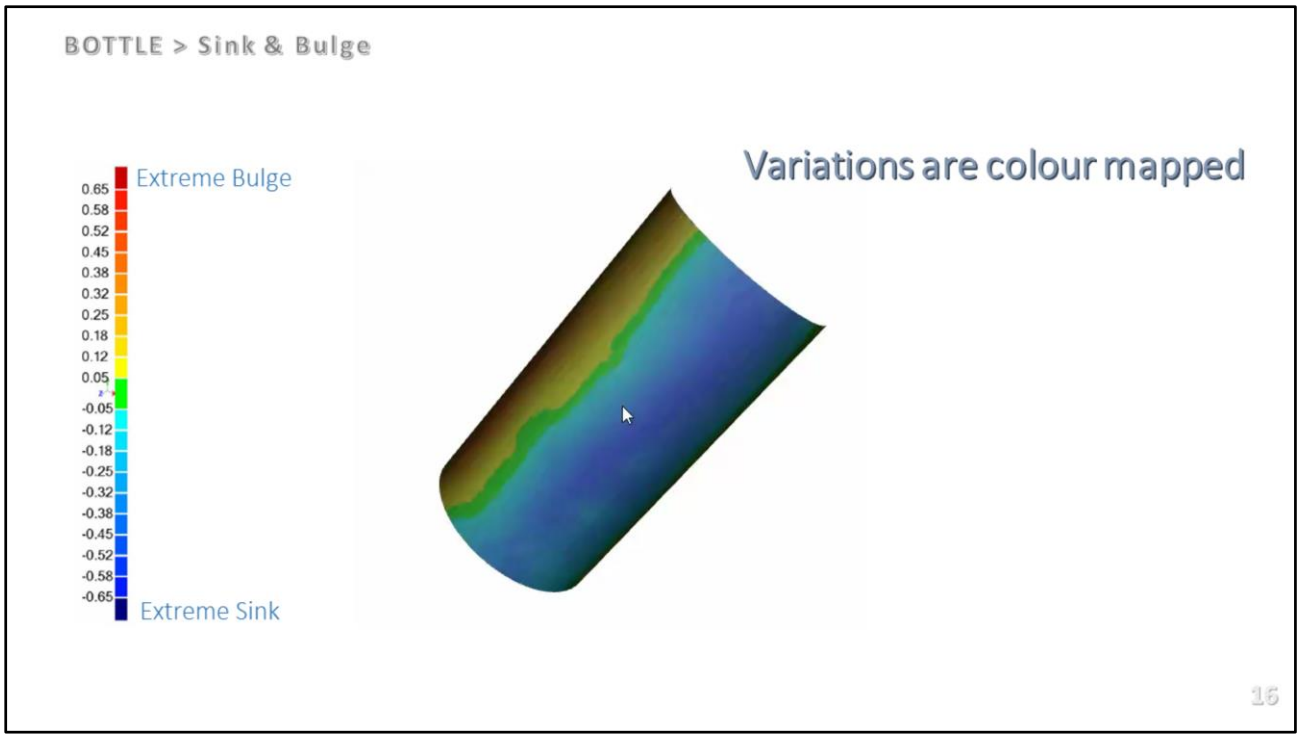
We have a short video on the device to provide some clarity to the method used.

The glass bottle must be coated to enable the system to ‘see’ it effectively and to reduce internal reflection of the laser cross, as the system uses the image of the reflected laser cross to determine the shape of the object.

The scanner determines its relative position in space through the use of reflective positioning stickers (the small white dots in the picture).



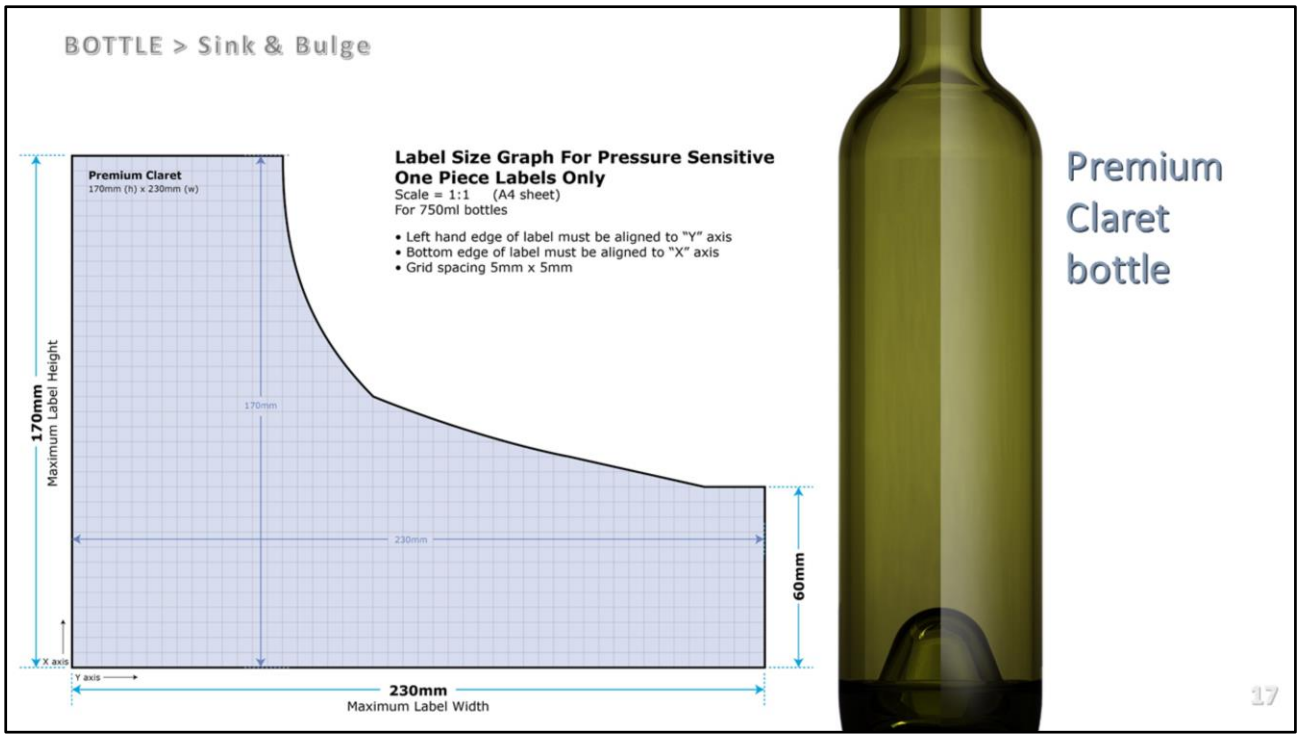
The scanned image is then trimmed to remove the sections of the bottle outside of the label panel and the resulting cylinder is compared to a ‘perfect’ geometric cylinder based on the bottle drawing.

The variations in the scanned bottle versus the perfect bottle are then colour mapped to provide a clear visual indication of the variations in the surface.

The red on the image indicates **extreme bulge** and the dark blue indicates **extreme sink**.

When trying to apply a label to this bottle issues may be encountered if the label crosses areas of differing sink/bulge, such as the area seen on the screen here.

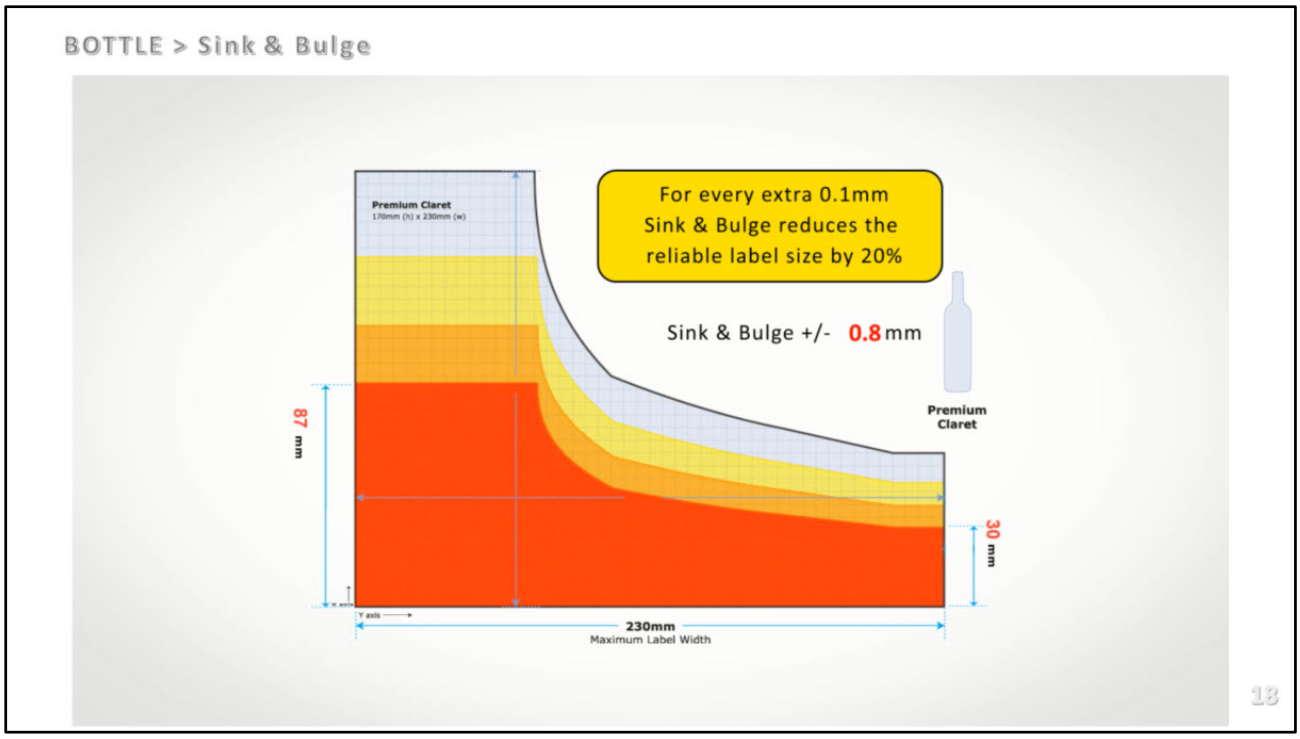
AND please note, the above images is the full label panel scan of the premium claret bottle.



One of the investigations conducted involved the premium claret bottle.

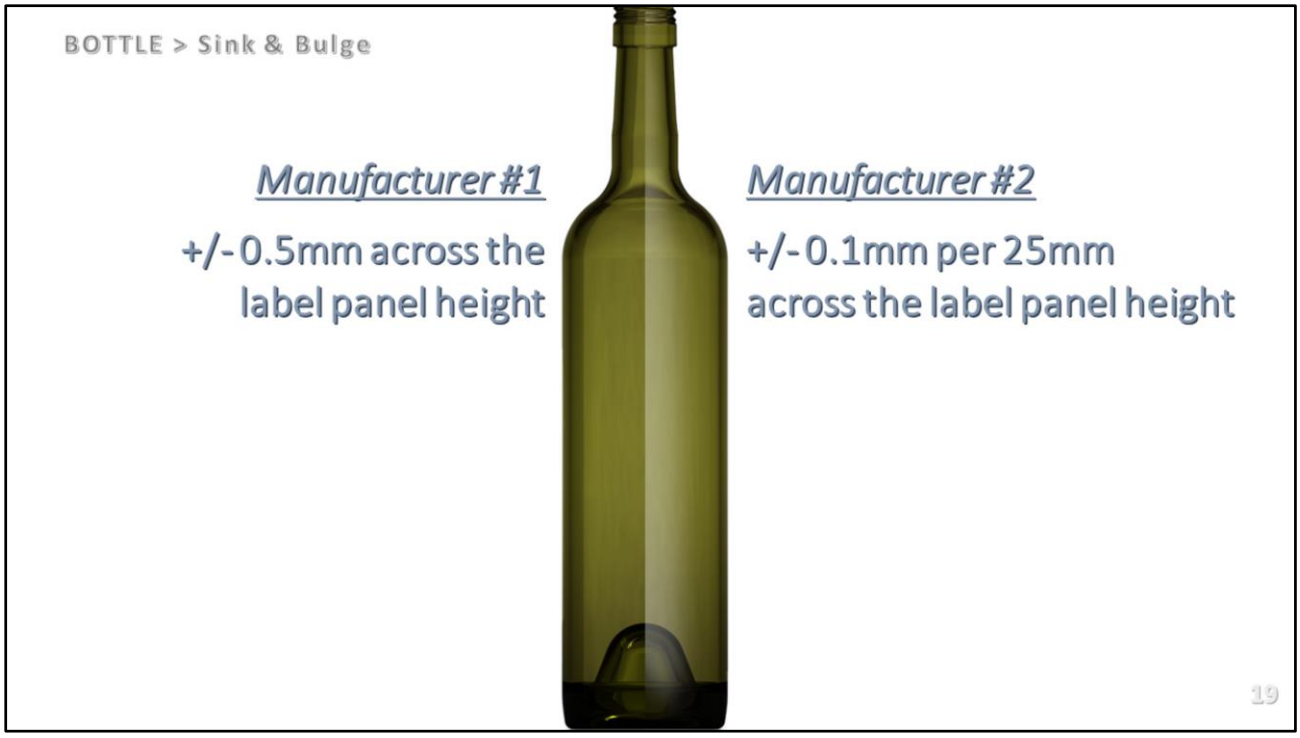
It has been determined that labels within the label size graphs as detailed in the WPA Guidelines can generally be applied to a suitable quality if the sink and bulge is less than +/-0.5mm.

However, if an extreme configuration of sink and bulge is encountered, where the entire tolerance is used within a small area, labeling issues can still occur.



It can be inferred from the studies we have conducted that for every 0.1mm above 0.5mm the label height would need to be reduced by approximately 20%.

As an example only we are showing the premium claret bottle label size.



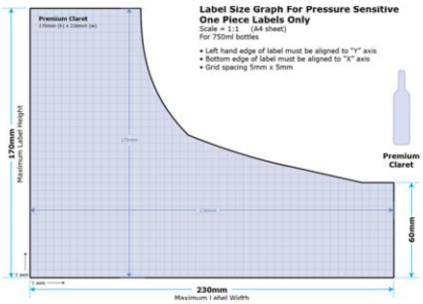
Currently the two domestic manufacturers of glass bottles have their own distinct specifications for sink and bulge.

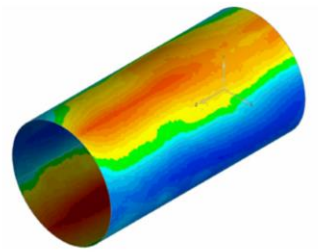
One specification is +/-0.5mm across the label panel regardless of the size of the panel.

The other is +/-0.1mm per 25mm of label panel height.

ie both agree that for a label panel of 125mm the specification is +/-0.5mm but for a panel of height 150mm one specification is +/-0.6mm and the other is still +/-0.5mm, for a panel of height 75mm the two specifications would be +/-0.3mm and +/-0.5mm.

BOTTLE > Sink & Bulge





Maximum tolerance of +/- 0.5mm through the label panel as industry standard.

OPEN DISCUSSION

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Question to the Panel:
Why do we have 2 distinct specifications?

We would prefer us all to agree on one specification for the industry.

WINE BOTTLE
Label Panel Specifications

Presentation by

Paul Grafton
Group QA Manager
Vinpac International

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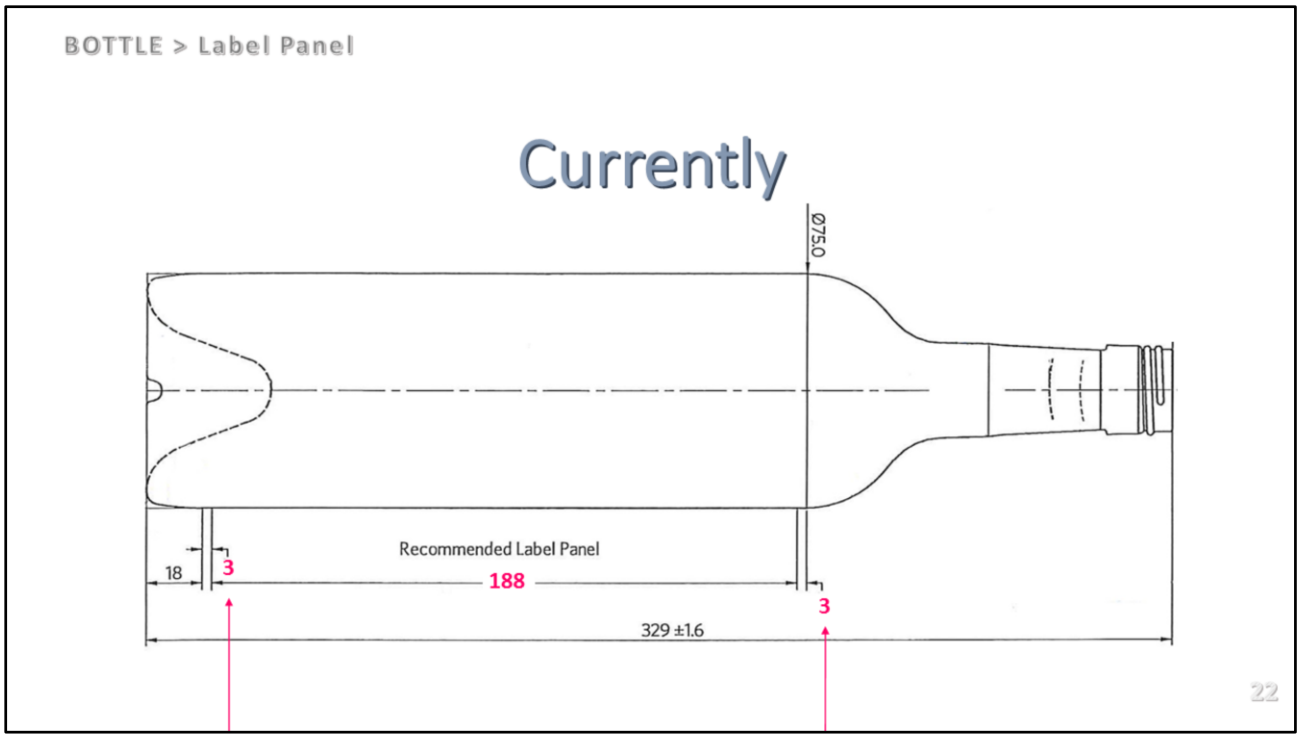
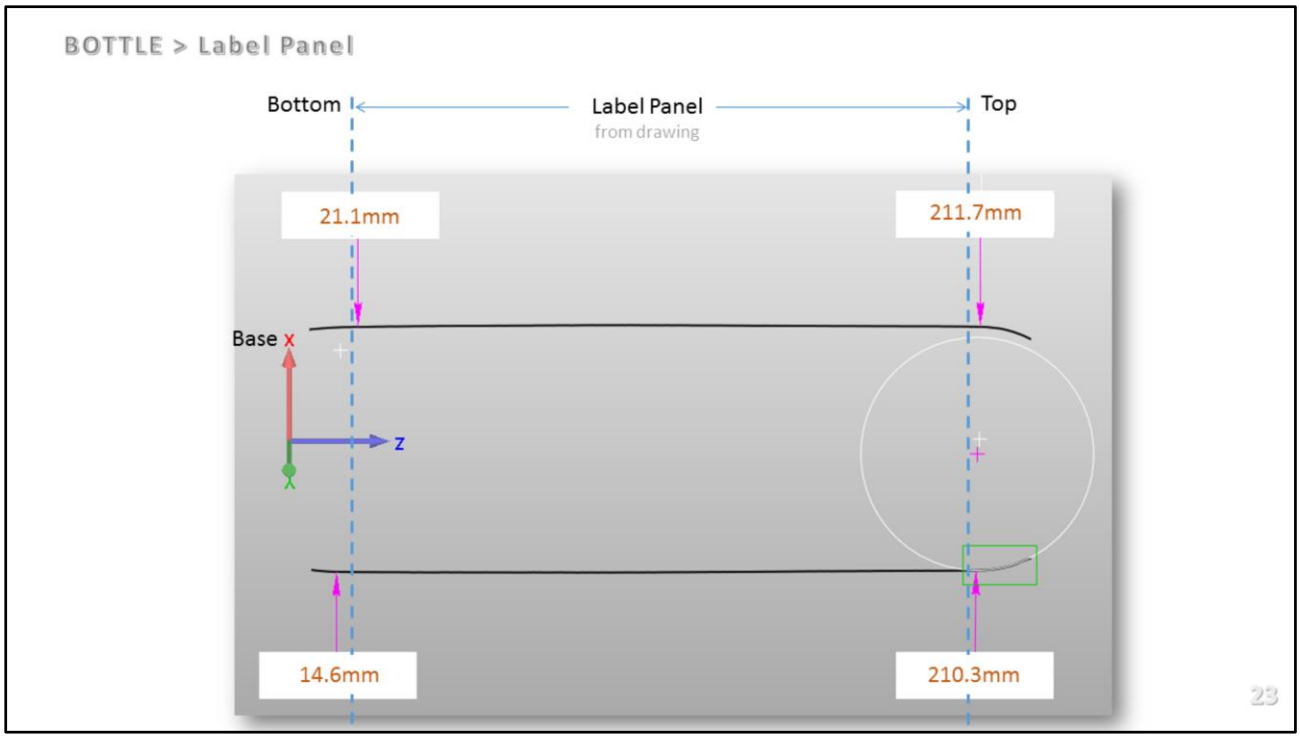


Label frilling can occur if the label overhangs the top or bottom edge of the label panel.

This is an extreme form of ‘sink’ as the bottle transitions away from the flat panel to the curve of the heel or shoulder.

As can be seen on the screen, currently the label panel has a 3mm zone on either side of the top and bottom.

This was designed to ensure that the curvature of the bottle at the heel and shoulder had flattened out and that the movement of the label during application was contained within the flat area.



Investigations using the scanning system previously mentioned have indicated that the radii of the shoulder and heel of the bottle can encroach on the label panel at the edges, even with the 3mm addition.

This slide illustrated a bottle, which has been scanned and then the image dissected vertically through the centre.

The bottle is laying on its side.

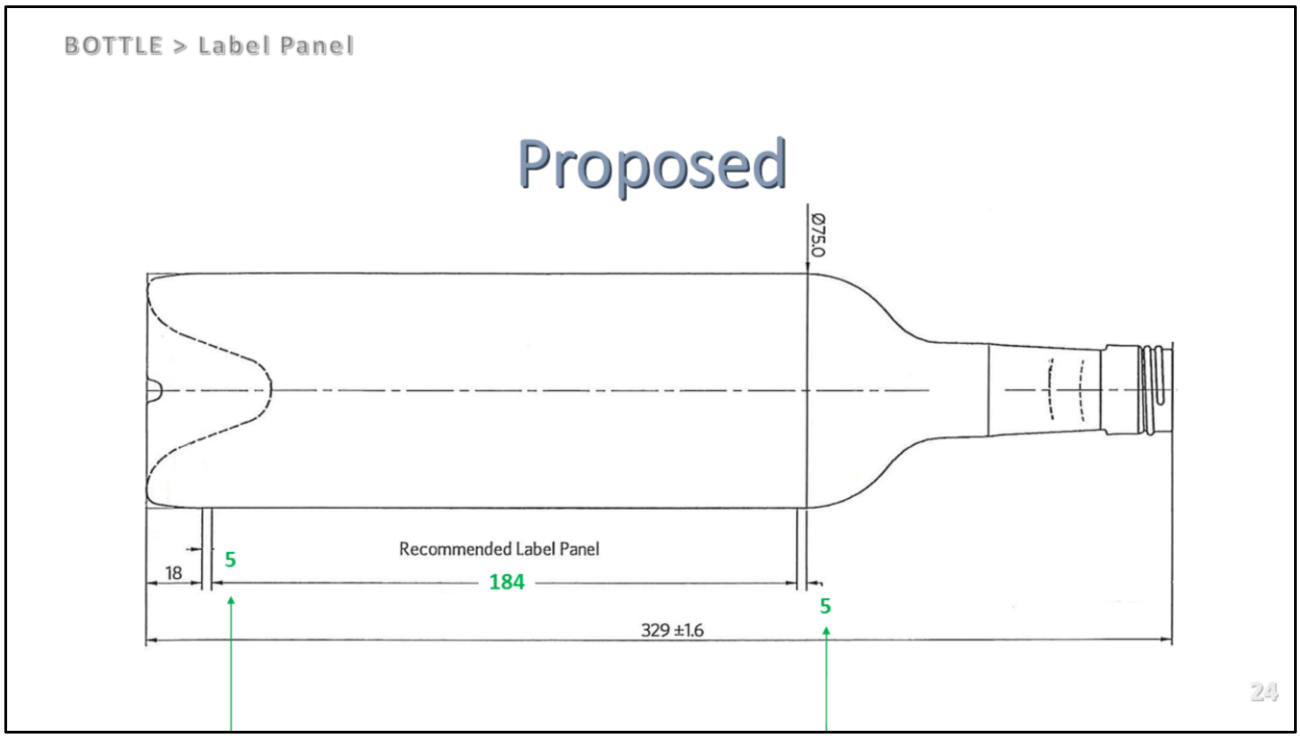
The engineering drawing states the label panel starts at 21mm from the base and the top is at 209mm. As shown by the blue dashed lined.

The numbers indicate the actual point where the curve transitions to straight.

If the label is designed to be exactly the same height as the label panel, even if the label panel is perfectly flat within the quoted dimensions, issues can occur.

These are caused by the variations which occur in the printing, rewind and application processes.

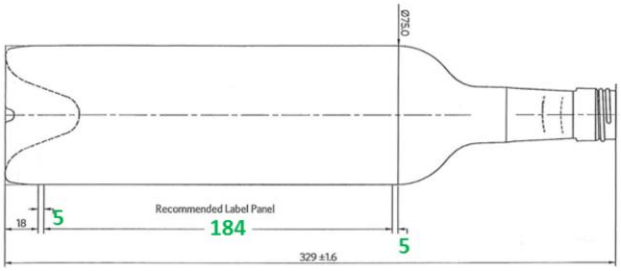
Combined these variations add up to at least 2mm and this tolerance needs to be subtracted from the overall height of the label panel.



We believe the current glass manufacturers' specifications need to be reviewed to ensure that they state a label panel that will allow for consistently acceptable label application.

We seek to have one specification for the entire industry and suggest one similar to that displayed on the screen.

BOTTLE > Label Panel



Glass specification allows for consistently acceptable label application across all bottles.

This drawing is of a Premium Claret bottle
but this issue is represented across all bottles.

OPEN DISCUSSION

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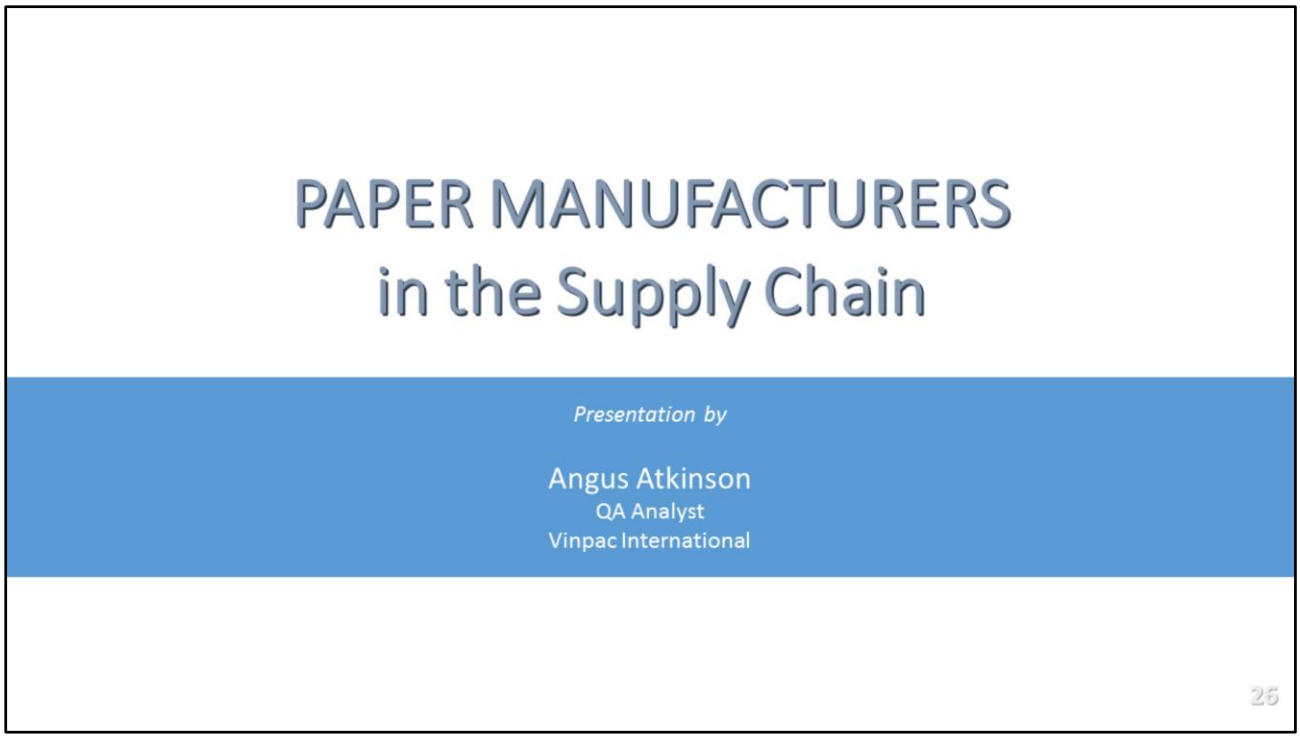
Question to the panel

Are there concerns from increasing the 3mm to 5mm?



The purpose of the WPA label guidelines is to increase the overall reliability of the wine supply chain.

All of us have the same customer, the owner of the wine brand. It is our collective responsibility (designers, printers, paper suppliers and packagers) to ensure the product is delivered to the consumer looking just like the customer expects.

Our objective is always to deliver the customer's complete expectations in packaging quality and presentation.

To that end we all need to understand the limitations of the products and processes we control, and how these affect other links in the supply chain.

Our discussion today reflects our ongoing efforts to improve this process.

2Kg FINAT

The FINAT standard for label adhesion testing requires an application pressure of 2kg per 50mm width (as per the standard roller).

This test is done in perfect conditions on a flat piece of glass with no surface treatment.

This is the standard used for all label adhesion testing and development.

Z-Wipe / Blade / Roller

The application methods used for wine labels range from foam rollers or blades to the flexible wiper (Z wipe).

All these methods work, and there are individual differences in outcomes. However, all have one common physical limitation.

The total pressure which can be applied compared to the label supplier standard.

(NB: FINAT = Féderation INternationale des fabricants et transformateurs d'Adhésifs et Thermocollants sur papiers et autres supports

A wine label applicator needs to wipe the full height of the label panel (typically 150mm or more) and both sides of the bottle.

This typically results in an actual application pressure of less than one sixth of the FINAT test method. (0.3 Kgs per 50mm)

The application pressure is further reduced by the force required to “wrap” the label around the bottle during application which increases with paper weight.

PAPER MANUFACTURERS > Paper Weight

	LABEL PROPERTIES	APPLICATION ISSUE(S)	WPA PAPER WEIGHT GUIDELINES
BODY	Tactile, very heavy papers	▪ Edge lifting ▪ Pre-releasing on the applicator ▪ Damage on divider insertion	135gsm Maximum
	Low weight papers	▪ Paper can distort & crease during application	80gsm Minimum
NECK	Heavy weight papers	▪ Highly likely to lift / winging	80gsm Maximum
	Low weight papers	▪ Likely to distort during application	60gsm Minimum

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For this reason there exists maximum and minimum paper weights for body labels that can be reliably applied by WPA members.

From experience with various paper stocks this is 135 gsm to 80 gsm.

Body labels over this weight often exhibit issues with poor application or edge lifting.

Body labels with weight below this value often distort during the application resulting in wrinkles or creases.

Necks labels are a slightly special case.

Due to the small radius of the necks the maximum and minimum paper weight is much lower.

From experience with various paper stocks this is 80 gsm – 60 gsm .

Neck labels over this weight often exhibit edge lifting.

Neck labels below this value often flex during application resulting in creases or mis-alignment.

PAPER MANUFACTURERS > Adhesives

Recommended adhesives from the Survey

PAPER MANUFACTURERS	PRINTERS
Z3338 Recommended for demanding applications such as sparkling and ideally any moisture should be removed by air knives.	Z3338 Recommended for demanding applications such as sparkling and ideally any moisture should be removed by air knives.
RP30/RF30 - Slight condensation RH9S or RP30X (available ex EU) - Heavy condensation	WLK202 Recommended for high condensation environments
Paper type dependent but most common are : SH6020+ C58	C58
	WLK 202 Wausau WL100

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One of the survey questions circulated for feedback last year was:

Please supply “a list of permanent adhesives with high initial tack that can be used and are compatible with condensation on bottles”

The final collated list is:
WLK202
Wausau WL100
C58
Z3338
RP30/RF30 and for heavy condensation RH93 or RP30X.

PAPER MANUFACTURERS > Paper Weight & Adhesives

BODY PAPER WEIGHTS
135gsm Maximum
80gsm Minimum

NECK PAPER WEIGHTS
80gsm Maximum
60gsm Minimum

ADHESIVES
Z3338
WLK202
C58
WLK 202 & Wausau WL100
RP30/RF30
RH9S or RP30X
SH6020+ C58

OPEN DISCUSSION

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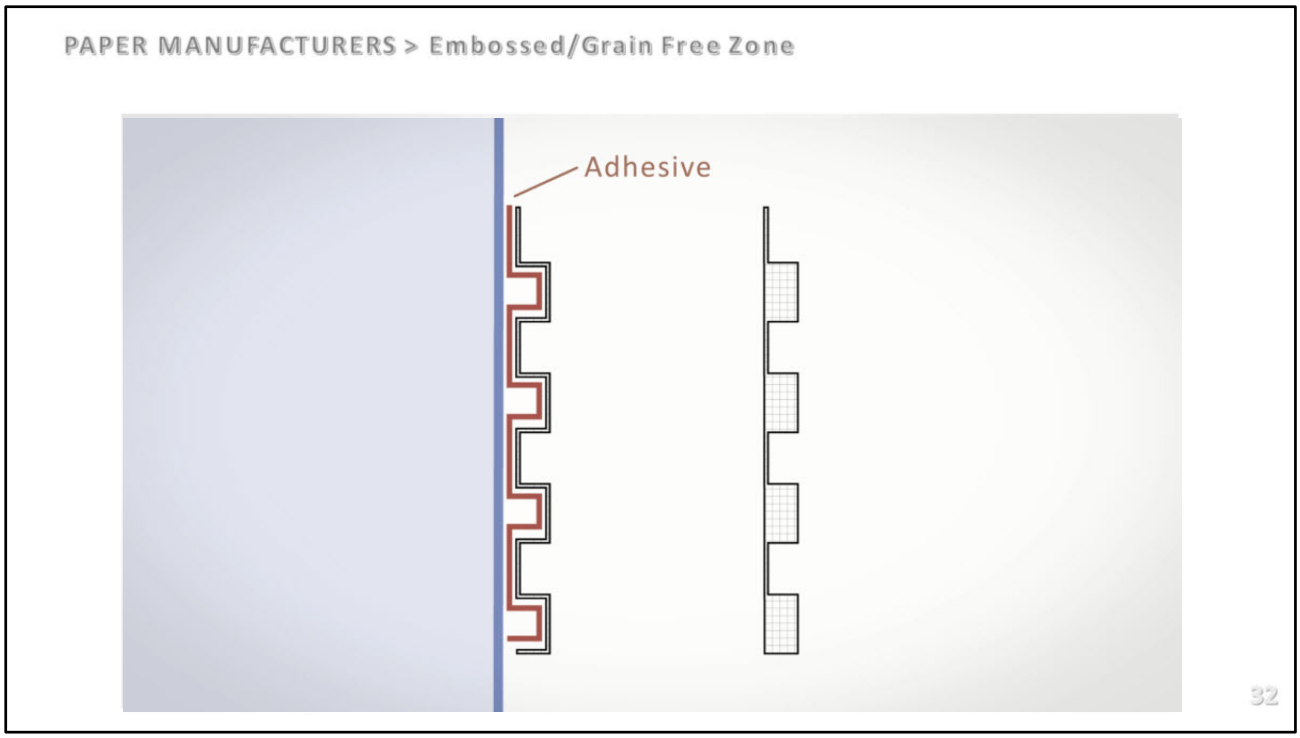
Questions to the panel:
Is this range correct?

Question to the panel:
What is the forum experience with any of these adhesives?



Wine labels often incorporate textures and embellishments which are features of the label design.

These can be performed during the paper manufacture using a process called “Laid Paper”, or by the printer using plates or rollers to mechanically emboss the printed label.

How this is achieved by the label supplier has consequences for the application and end user performance.

The most common feature which affects label performance is Embossing, the process of mechanically distorting the label cross section after printing in order to create texture or raised features.

PAPER MANUFACTURERS > Embossed/Grain Free Zone

LABEL PROPERTIES	APPLICATION	WPA GUIDELINES
Laid paper stock properties: ▪ Textured surface ▪ Flat adhesive side ▪ Optimum contact	▪ Improved adhesion due to better contact ▪ No requirement for Embossing Free Border	No need
Embossing/Grain introduced at printer ▪ Textured surface	▪ Reduced adhesion area causing edge lifting. ▪ Increased paper stiffness ▪ Adhesive is exposed to oxygen decay	3mm border required

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All embossing reduces the ultimate adhesive contact with the wine bottle surface.

For embellishments over limited areas of the label this often contributes to “bubbling” or “blisters”.

For larger areas (particularly whole label embossing or grain) this reduces the total label adhesion and contributes to edge lifting after application.

Based on our experience aggressive grain embossing can reduce label adhesion to 30%’

For this reason the WPA guideline on label design incorporates a mandatory 3mm Emboss/Grain Free Zone around the label.

This allows maximum adhesive contact at the critical label edges to minimize label edge lifting.

PAPER MANUFACTURERS > Embossed/Grain Free Zone

WPA guidelines minimum 3mm embossed/grain free zone

OPEN DISCUSSION

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Question to the panel:
Can this be adopted as an industry guideline?

LABEL DESIGNERS & PRINTERS in the Supply Chain

Presentation by

Angus Atkinson
QA Analyst
Vinpac International

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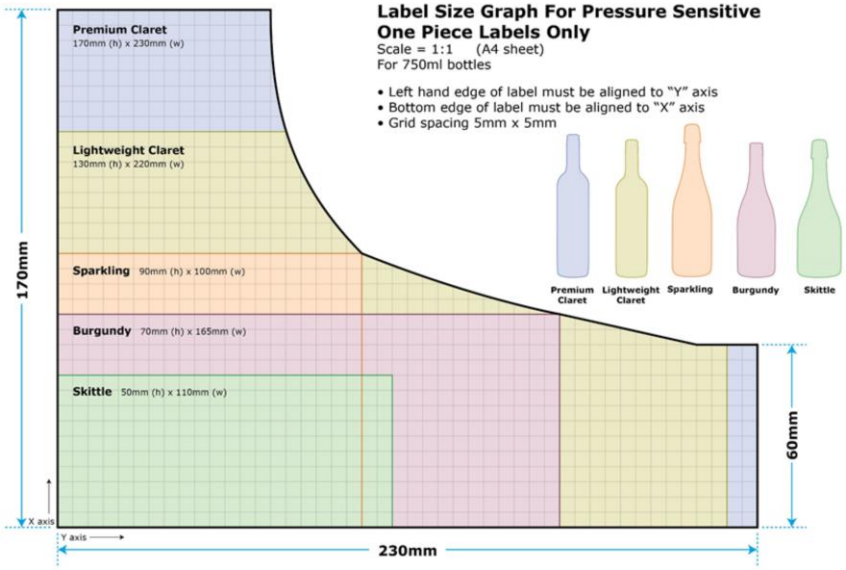
LABEL DESIGNER & PRINTERS > Label Sizing



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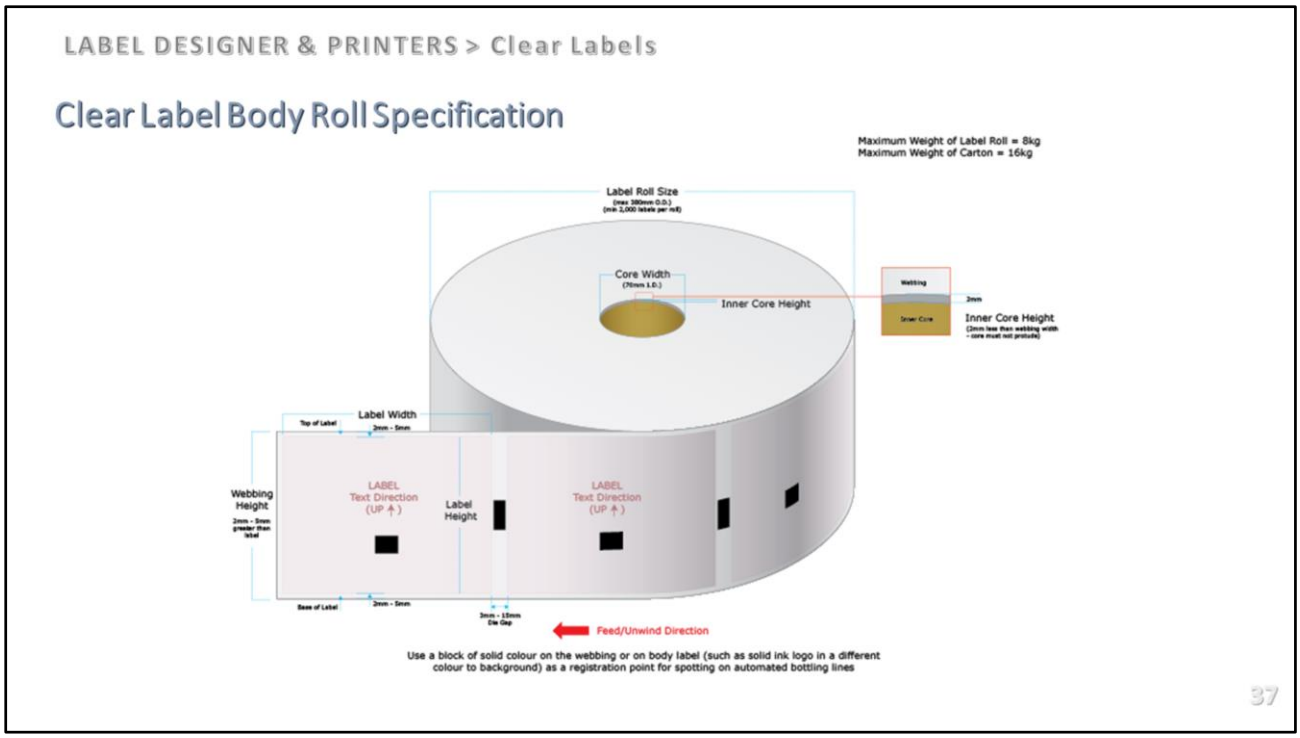
The Label Sizing Chart has been developed over many years as an indicator of label application reliability on common bottle sizes.

The chart does not guarantee application performance, nor does it ultimately limit the size and shapes of labels.

It exists to provide assistance with design decisions based on current industry knowledge, and maximise customer satisfaction with the process.

Any variations beyond the Label Size Chart can always be addressed with the individual wine packager.



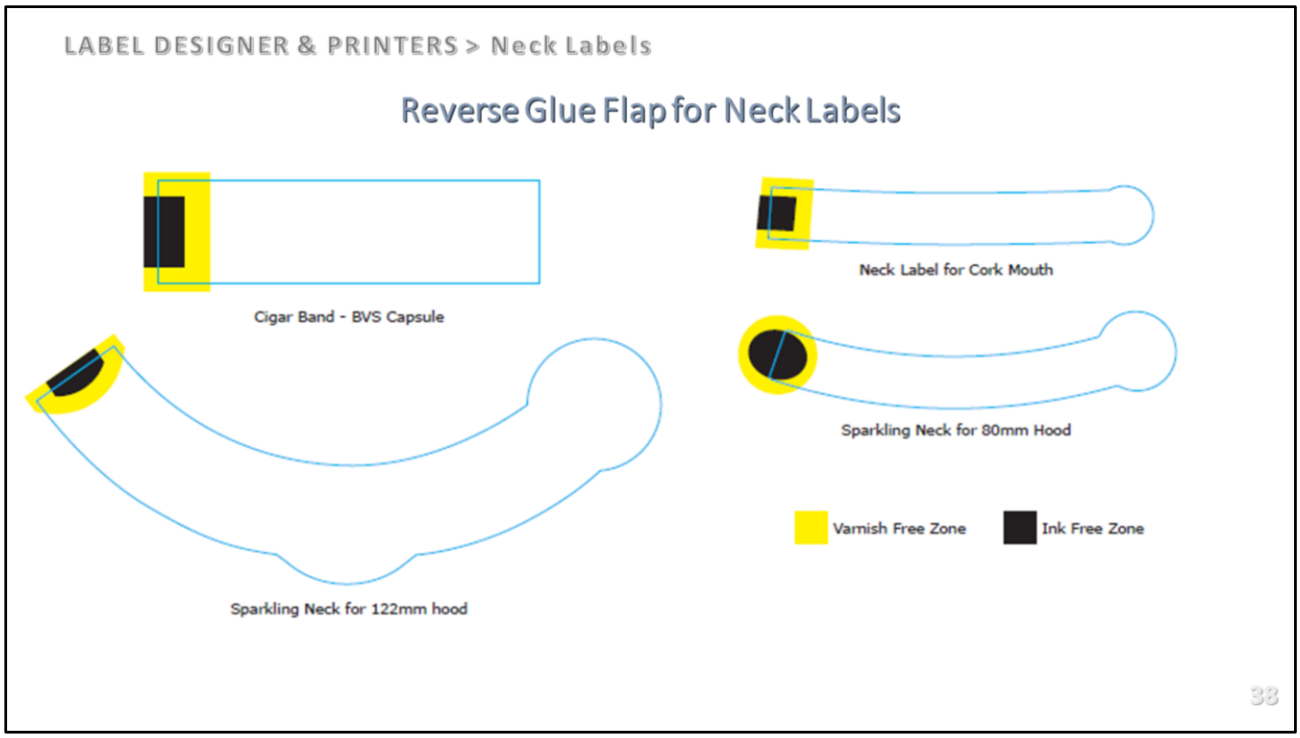
Label applicators use light sensors to detect the edges of the label to ensure correct placement and feeding.

Clear labels require a solid ink mark for detection.

This can often be found in the label graphic.

However, those labels which do not include a large square opaque mark, particularly clear labels on clear webbing, require a solid ink mark printed on the reverse side of the webbing.

This provides a robust orientation mark while leaving the label area unmodified.

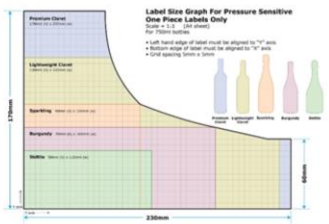


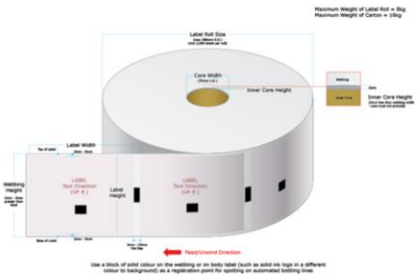
The Reverse Glue Flap and Small Non-Inked area have been shown to improve application and reduce the instances of neck labels lifting after application.

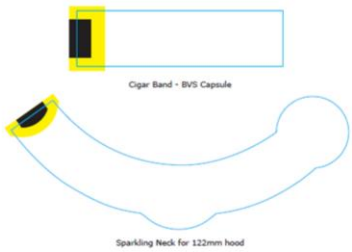
Minimum 15mm free of varnish with a small non-inked area.

Minimum label height of 18mm.

LABEL DESIGNER & PRINTERS > Neck Labels







OPEN DISCUSSION

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Question to the panel:
Can these recommendations be accepted as an Industry Standard.

STANDARD TEST METHODS
in the Supply Chain

Standard Test Methods

LABEL PROPERTIES	TEST METHODS
COBB Values	**AUS/NZ standard** 1301.411s:2004 Methods of test for pulp and paper Part 411s: Water absorptiveness of paper and paperboard (Cobb test). Open discussion to include Cobb testing as part of the paper/label suppliers R&D in an effort to reduce label bubbling.
Determining abrasive resistance	**AUS/NZ standard** AS 2323/4/3-2006 Methods of test for single sided and double sided pressure- sensitive adhesive tape. (Scuff & Rub Test)
Determining ability of adhesive to resist water ingress post bottling	**WPA Ice Bucket** Test method
Determining whether sufficient varnish/ink application on label to resist moisture absorption post bottling	**WPA Water Spray** Test method

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These are test methods used in our industry.

Two of these are existing AUS/NZ standards (The COBB test and the Scuff & Rub Test).

Two of these are internal WPA methods used (the Ice Bucket Test & Water Spray Test)

Copies of all four are included in your package for review.

Pressure Sensitive Label Forum

Thanks for participating