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## AUSTRALIAN GRAPE AND WINE

# WINE PACKAGING GUIDELINE

## Guidelines for the use of Wine Packaging

**AUSTRALIAN GRAPE AND WINE INCORPORATED**

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**Wine Packaging Guidelines:**

The following guidelines have been prepared by the Australian Grape and Wine Packaging Committee. The guidelines are intended to provide a basic level of understanding of fundamental wine packaging issues for small to medium wineries and new entrants to the industry and are best used as a guide to the discussions that wineries should be having regarding specifications required for dry goods between packaging suppliers, wineries/brand owners and wine packagers.

The expert advice provided by members of the Australian Grape and Wine Packaging Committee in the preparation of this document is gratefully acknowledged. These guidelines are supplemented by 'The Code of Good Manufacturing Practice for the Australian Grape and Wine Industry' prepared by the Australian Wine Research Institute (AWRI) and available to download from the AWRI website: www.awri.com.au and the Wine Packagers of Australia (WPA) Specifications.

**Packaging Committee:**

The Packaging Committee was established by Australian Grape and Wine to enable the development of a unified position for the wine industry in regard to packaging related issues. By maintaining a forum for direct discussion amongst industry stakeholders, the Packaging Committee is positioned to respond to political, technological, environmental, regulatory and market driven changes in wine, wine product and brandy packaging.

**Further Information:**

For further information contact the Executive Officer of the Packaging Committee by phone on (08) 8133 4308 or email via info@agw.org.au

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## Fit for Purpose General Principal

All dry goods shall be fit for the purpose as a component in a packaged wine container and be capable to withstand normal filling and packaging processes.

Dry goods must not:

- cause difficulties on bottling lines;
- cause damage to, or degradation of, the finished product;
- cause unacceptable risk to persons interacting with the dry good
- fail to maintain wine and packaging integrity through the distribution chain

All dry goods shall be of a high quality appearance and structure appropriate for all wine products packaged, and withstand the range of reasonably foreseeable transport, storage, retail display, customer use and cellaring conditions.

Dry goods performance may be relative to the production lines it is packaged on. Suppliers are expected to share manufacturing data to support production line investigations into root cause and corrective action, where dry good packaging outcomes do not meet specification.

## 1. Wine Supply & Filling

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| Dissolved Oxygen, (DO), in wine | Can have a detrimental effect on product quality and shelf-life. | Sparge as required to reduce the DO to less than 0.5 mg/L (ppm) in tank. Check DO on filled bottles to ensure that DO pick-up on line is not excessive. |
| Total Package Oxygen, (TPO) in bottle. | This includes the DO in the wine, oxygen that is present in the headspace of the bottle (ullage space) on closing. | Should be kept as low as possible. Excess oxygen can result in premature aging resulting in colour changes (browning), flavour loss and the development of undesirable faults, leading to reduced shelf life.<br><br>TPO levels should be measured during packaging to ensure that $O_2$ pick-up is controlled to a minimum and oxygen in the headspace of the bottle is minimised.<br><br>Total package oxygen at bottling can be measured in a number of ways including the following:<br><br>• Oxy-luminesence technologies which rely on fluorescence measurements to analyse oxygen concentration in a filled wine bottle non-destructively[1] .;<br>• Using direct oxygen measurement technologies to quantify dissolved oxygen following the application of appropriate bottle shaking protocols and calculations to account for the residual oxygen in the headspace[2]. |
| Dissolved Carbon Dioxide | The level of dissolved carbon dioxide will determine the level of "spritz" in the wine. | If levels are too high this can cause filling problems due to fobbing. The closure and bottle must be appropriate for the dissolved carbon dioxide level. Dissolved carbon dioxide should be measured before and after filling, on pre-chilled wine samples. Filling temperature can influence the resulting concentration of $CO_2$ in the packaged wine. |

[1] ASTM F2714 Standard Test Method for Oxygen Headspace Analysis of Packages Using Fluorescent Decay.
[2] https://www.awri.com.au/wp-content/uploads/tpo_fact_sheet.pdf

| | | |
|---|---|---|
| Nitrogen, carbon dioxide and argon | Can be used to provide an inert gas blanket during processing as a protection against oxidation. These gases can also be used to minimise the concentration of oxygen in the headspace of the wine during packaging, by application prior to and subsequent to filling.. | Whilst only sparingly soluble at low temperatures, dissolved nitrogen can cause excessive frothing during filling. Both carbon dioxide and nitrogen can be used to provide a cost-effective and efficient way of flushing oxygen out of bottled wine, both prior to filling and post-fill prior to application of the closure. |

| Wine Supply & Filling continued... | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Filtration | Filtration can reduce or remove particulate matter and microbial contamination. | Integrity testing of absolute filters should be undertaken before and after filling. Testing of product filterability index should be determined to maximise filter life**. It is recommended that 0.45 micron membrane filtration should be used for wines containing fermentable sugars.** Filtration conditioning is essential. Manufacturers recommendations are required to ensure the correct filtration is used |
| Fill Heights | The fill height should be at a level that allows enough ullage space for expansion of the wine at increased temperatures. | For standard Cetie cork finish bottles the ullage space should be greater than 12mm @ 20deg C. The use of a vacuum corker is strongly recommended.<br>With standard BVS finish bottles the ullage space should be greater than 30mm. Bottle supplier recommendations should be used. |
| Fill Volume | The volume in the bottle must conform to the labelled volume under the National Trade Measurement Legislation which can be either the Minimum Fill System or the Average Quantity System. | Fill volumes must be measured using statistically reproducible systems. For information on National Trade Measurement Legislation contact the National Measurement Institute – www.measurement.gov.au |
| Sanitation | Clean sterile equipment is a prerequisite to the proper packaging of wine. | High levels of spoilage yeasts and bacteria will develop if the wine supply lines, filtration and filler are not comprehensively cleaned to manufacturer's recommendations. Machines and supply systems should be sanitised before bottling. |

## 2. Wine Bottle Closures

### Natural Cork, Technical Cork, Sparkling Wine Cork, Synthetic Closures

| | | Recommendation/Observation | | | |
|---|---|---|---|---|---|
| **Critical Issue** | **Description** | **Natural Cork** | **Technical Cork** | **Sparkling Wine Cork** | **Synthetic Closure** |
| Visual Grade | The visual grade is assessed by correlating the number of defects or natural blemishes on the closure to a pre-set grade with the supplier. | Price and visual grade are directly related. Lower visual grades increase the risk of cork failure. A tolerance of +/- 5% can be set for each level of cork within the respective grade. | Price and visual grade are directly related. Lower visual grades can increase the risk of cork failure. A tolerance of +/- 5% can be set for each level of cork within the respective grade. | Price and visual grade are directly related. Lower visual grades can increase the risk of cork failure. A tolerance of +/- 5% can be set for each level of cork within the respective grade. | Not Applicable. |
| Critical Defects | These are defects that will potentially cause the closure to fail. | Zero is the target. | Zero is the target. | Zero is the target. | Zero is the target. |
| Non Critical Defects | These are defects that although visible are unlikely to cause the closure to fail. | Non critical defect levels increase as the visual grade decreases. | Non critical defect levels increase as the visual grade decreases. | Non critical defect levels increase as the visual grade decreases. | |

| Wine Bottle Closures continued... | | Recommendation/Observation | | | |
|---|---|---|---|---|---|
| **Critical Issue** | **Description** | **Natural Cork** | **Technical Cork** | **Sparkling Wine Cork** | **Synthetic Closure** |
| Closure Treatment | Closures are usually treated with a coating to help insertion, extraction and wine travel reduction. | Cork extraction forces should be in the range of 25-40KG/F after 24 hours at room temperature (20˚C) for red wine and at fridge temperature (5˚C) for white wine. Wine travel up the side of the cork should not occur. Based on the treatment used the best before date should be 6 months from the production date. | Cork extraction forces should be in the range of 25-40KG/F after 24 hours at room temperature (20˚C) for red wine and at fridge temperature (5˚C) for white wine. | Removal of sparkling wine corks relies upon a twisting torque motion in the range of 2.2nm to 2.8nm. The treatment and insertion depth will affect the ease of extraction. Insertion depths should be monitored during the production run. | Cork extraction forces should be in the range of 25-40KG/F after 24 hours at room temperature (20˚C) for red wine and at fridge temperature (5˚C) for white wine. Wine travel up the side of the cork should not exist. |
| Closure Taint | All closure have the potential to impact on wine aroma and flavour. This includes oak-related compounds such as TCA, adhesive related taints, plastic-related contaminants. | Cork batches should contain a minimal level of taint affected corks, as evaluated through an agreed sensory method. | Cork batches should contain a minimal level of taint affected corks, as evaluated through an agreed sensory method. | Cork batches should contain a minimal level of taint affected corks, as evaluated through an agreed sensory method. | No flavour modification should occur. No detectable difference should be discernible using an agreed sensory method. |
| Flavour Scalping | Closures have the ability to mask or absorb aroma and flavour compounds from the wine. | No masking or absorbing should occur. | No masking or absorbing should occur. | No masking or absorbing should occur. | No masking or absorbing should occur. |
| Closure Moisture | The moisture level of closures is critical to their stability and performance. | Treated corks should have a moisture level of 6-8%. | Treated corks should have a moisture level of 4-8%. | Treated corks should have a moisture level of 4-8%. | Not Applicable. |
| **Wine Bottle Closures continued...** | | **Recommendation/Observation** | | | |
| **Critical Issue** | **Description** | **Natural Cork** | **Technical Cork** | **Sparkling Wine Cork** | **Synthetic Closure** |

| | | | | | |
|---|---|---|---|---|---|
| Oxygen transmission rate, (OTR) | The rate at which oxygen diffuses through a closure into wine is called the oxygen transmission rate (OTR) and it can have a significant impact on wine development and shelf-life. High OTR values can lead to shortened shelf life. OTR can be measured on unfilled and filled wine bottles using a non-destructive method[3]. Destructive methods are also available[4,5] | Determine OTR with sufficient replication. Ensure that bottle type and closure application is consistent. | Determine OTR with sufficient replication. Ensure that bottle type and closure application is consistent. | Determine OTR with sufficient replication. Ensure that bottle type and closure application is consistent. | Determine OTR with sufficient replication. Ensure that bottle type and closure application is consistent. |

[3] https://www.awri.com.au/wp-content/uploads/otr_analysis_fact_sheet.pdf
[4] ASTM F1307 Standard Test Method for Oxygen Transmission Rate Through Dry Packages Using a Coulometric Sensor.
[5] ASTM F1927 Standard Test Method for Determination of Oxygen Gas Transmission Rate, Permeability and Permeance at Controlled Relative Humidity Through Barrier Materials Using a Coulometric Detector

| Wine Bottle Closures continued... | | Recommendation/Observation | | | |
|---|---|---|---|---|---|
| **Critical Issue** | **Description** | **Natural Cork** | **Technical Cork** | **Sparkling Wine Cork** | **Synthetic Closure** |
| Storage | Storage of closures is critical to the stability and performance. Closures readily absorb and desorb moisture. Closures readily absorb volatile compounds from the environment. | Corks must be stored in a clean dry and cool environment. Refer to supplier for temperature and humidity recommendations. They must not be stored with other chemicals /cleaning agents/paints etc.<br>Corks should be transported and stored separate from all timber products to prevent contamination. | Corks must be stored in a clean dry and cool environment. Refer to supplier for temperature and humidity recommendations. They must not be stored with other chemicals /cleaning agents/paints etc.<br>Corks should be transported and stored separate from all timber products to prevent contamination. | Corks must be stored in a clean dry and cool environment. Refer to supplier for temperature and humidity recommendations They must not be stored with other chemicals /cleaning agents/paints etc.<br>Corks should be transported and stored separate from all timber products to prevent contamination. | Closures must be stored in a clean dry and cool environment. Refer to supplier for temperature and humidity recommendations They must not be stored with other chemicals /cleaning agents/paints etc. |

| Wine Bottle Closures continued... | | Recommendation/Observation | | | |
|---|---|---|---|---|---|
| **Critical Issue** | **Description** | **Natural Cork** | **Technical Cork** | **Sparkling Wine Cork** | **Synthetic Closure** |
| Usage | Maintenance and set-up of corking machinery is critical to closure performance. | Corker jaws must be clean and free from chips/cracks or abrasions.<br>Only food grade lubricants can be used.<br>Compression diameter is critical and the cork should only be compressed to 16mm.<br>Vacuum corking equipment should be used to maintain a vacuum of 0 to -35kPa under the closure.<br>Headspace (vacuity) should be maintained at a minimum of 12mm (for a 750mL bottle), from the bottom of the closure to the wine surface, when the wine is at 20 degrees, to reduce the likelihood of corks pushing out due to increases in storage temperature. | Corker jaws must be clean and free from chips/cracks or abrasions.<br>Only food grade lubricants can be used.<br>Compression diameter is critical and the cork should only be compressed to 16mm.<br>Vacuum corking equipment should be used to maintain a vacuum of 0 to -35kPa under the closure.<br>Headspace (vacuity) should be maintained at a minimum of 12mm (for a 750mL bottle), from the bottom of the closure to the wine surface, when the wine is at 20 degrees, to reduce the likelihood of corks pushing out due to increases in storage temperature. | Corker jaws must be clean and free from chips/cracks or abrasions.<br>Only food grade lubricants can be used.<br>The recommended Insertion is 23mm +/- 1mm after muselet application. | Corker jaws must be clean and free from chips/cracks or abrasions.<br>Only food grade lubricants can be used.<br>Compression diameter is critical and the closure should only be compressed to 16mm.<br>Vacuum corking equipment should be used to maintain a vacuum of 0 to -10kPa under the closure.<br>Headspace (vacuity) should be maintained at a minimum of 12mm (for a 750mL bottle), from the bottom of the closure to the wine surface, when the wine is at 20 degrees, to reduce the likelihood of closures pushing out due to increases in storage temperature. |

| Roll-On Tamper Evident (ROTE) Closures | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Dimension | Length:<br>Diameter:<br>Ovality:<br>Compatibility: | As specified (+/- 0.25mm)<br>As specified (+/- 0.05mm)<br>Tolerance (+/- 0.4mm)<br>Check compatibility with bottle type. |
| Material & Thickness | Aluminium Alloy 8011<br>Thickness<br>Hardness | Discuss with supplier<br>As specified (+/- 0.01mm)<br>Different specifications for hardness exist - essential to discuss with supplier as will impact on application |
| Oxygen transmission rate, (OTR) | The rate at which oxygen diffuses through a closure into wine is called the oxygen transmission rate (OTR) and it can have a significant impact on wine development and shelf-life.<br>High OTR values can lead to shortened shelf life. OTR can be measured on unfilled and filled wine bottles using a non-destructive method[3]. Destructive methods are also available[4,5] | The OTR value is impacted by the liner used. The OTR should be determine with sufficient replication. Ensure that bottle type and closure application is consistent. |
| Liner | Different liners are available from different suppliers and have the potential to impact on the aroma and flavour compounds present in the wine. | It is essential to discuss liner specifications with suppliers as different liners provide different sealing capabilities, which have the potential to affect OTR and resultant shelf life.<br>Defects or scratches on the liner can result in oxidation and/or leakage. |
| Decoration | As specified by Artwork.<br><br>Scuff resistance. | As per agreed colour tolerances with suppliers (high/low colour ranges).<br>Scuff testing specification to be discussed with supplier. |
| Knurling & Bridges | These are areas where defects can occur in the manufacturing process such as broken bridges or poorly defined knurlings. | Regular inspection should occur to ensure that these defects do not occur. |

| Roll-On Tamper Evident (ROTE) Closures | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Storage & Transportation | Storage of ROTE capsules is critical to the stability & performance. ROTE capsules handled & stored incorrectly can be damaged and not dispense and apply correctly. The wadding material can absorb external flavour contaminants and the storage should reflect this possibility. | ROTE closures must be stored in a clean dry cool environment. Capsules must not be stored with other goods or goods stored on top which can damage the capsules. Ensure palletised cartons are placed onto pallets with no overhang. |
| Usage | Maintenance and set-up of ROTE capping heads is critical to capsule performance. | Refer to capping machine & cap manufacturer manuals for capping head set up.<br>Critical points to be covered are head pressure, redraw and thread/tuck<br>Specifications of bottle finish, capsule and capping machinery must be compatible. |
| | | |
| **Crown Seal** | | |
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Dimension | Height:<br>Diameter External:<br>Diameter Internal:<br>Flange Angle:<br>Dome radius:<br>Compatibility: | As specified (+/- 0.35mm)<br>As specified (+/- 0.55mm)<br>As specified(+/- 0.25mm)<br>10 degrees – 20 degrees<br>140mm to 200mm<br>Check compatibility with bottle type. |
| Material & Thickness | Tin Plate<br>Stainless Steel Type AESI -430 | As specified (+/- 0.03mm)<br>As specified ( “ 0.01mm) |
| Liner | A high oxygen barrier liner is recommended for long term sealing of wine. | Discuss liner requirements with supplier/s to ensure that specifications meet requirements. |

| Crown Seal continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| | | |
| Oxygen transmission rate, (OTR) | The rate at which oxygen diffuses through a closure into wine is called the oxygen transmission rate (OTR) and it can have a significant impact on wine development and shelf-life.<br>High OTR values can lead to shortened shelf life. OTR can be measured on unfilled and filled wine bottles using a non-destructive method[3]. Destructive methods are also available[4,5] | The OTR value can be affected by the liner used. The OTR should be determined with sufficient replication. Ensure that bottle type and closure application is consistent. |
| Decoration<br><br>Varnish | As specified by Artwork.<br><br>Food grade, varnishes used to meet standards | As per agreed colour tolerances with suppliers (high/low colour ranges). Specify varnishes used are resistant to alcohol water & abrasion. |
| Storage & Transportation | Proper storage conditions for crown is critical to the stability & performance. Crown seals handled & stored incorrectly can be damaged and not dispense and apply correctly. The wadding material can absorb external flavour contaminants and the storage should reflect this possibility. | |
| Usage | Maintenance and set-up of Crown capping heads is critical to capsule performance. | Refer to capping machine & cap manufacturer manuals for capping head set up. |

| Crown Seal continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Performance | Pressure resistance: Recommend secure seal testing of product using an approved test pressure vessel at start up & at regular intervals during bottling.<br>Test application using no/go gauge at regular intervals during bottling. | Refer to supplier specifications as to pass/fail dimensions and secure seal requirements. A Go/no go gauge should identify 3 crimping diameters – the ideal, min & max tolerance for passing. |

| **Alternative Closures** |
|---|
| Increased number of alternative closures available – manufacturing and application specifications are very specific. Comprehensive investigation to be undertaken with supplier |

| Decorative Capsules | | Recommendation/Observation | | |
|---|---|---|---|---|
| **Critical Issue** | **Description** | **PVC / PET / Spinnable Polylaminate** | **Metal** | **Polylaminate Sparkling Wine Hoods** |
| Dimension | Length:<br>Top Diameter:<br>Taper:<br>Ovality:<br>Orientation Mark: | Per product specification (+/- 1mm)<br>Per product specification (+/- 0.5mm)<br>1.0 - 1.2 degrees<br>1.0mm max<br>Not Applicable. | Per product specification (+/- 1mm)<br>Per product specification (+/- 0.5mm)<br>1.0 - 1.2 degrees<br>1.0mm max<br>Not Applicable. | Per product specification (+/- 1mm)<br>Per product specification (+/- 0.5mm)<br>4.5 degrees<br>2.0mm max<br>Per product specification. |
| (Top Disc) Air Holes | Size:<br>Number of holes:<br>Distance from centre: | 1.0mm - 1.5mm<br>Per product specification.<br>5mm approx | 1.0mm - 1.5mm<br>Per product specification.<br>5mm approx | 1.0mm - 1.5mm<br>Per product specification.<br>Not Applicable. |
| Tear Tabs | Performance:<br><br>Width:<br>Protruding Section: | Per product specification.<br><br>PVC 4.5mm +/- 0.5mm<br>PVC 3.5mm +/- 1.0mm (length) | Not Applicable. | Tears cleanly along the edges of the tear tab strip.<br>4.5mm +/- 0.5mm<br>3.5mm +/- 1.0mm (length) |
| Material Thickness | | PVC: As specified (+/- 0.01mm)<br>Foil: As specified (0.04mm thick) | As specified (+/- 0.01mm) | Body: As specified (+/- 0.01mm)<br>Foil: As specified (+/- 0.1mm) |
| Decoration | As specified by Artwork. | As per agreed colour tolerances with suppliers (high/low colour ranges). | As per agreed colour tolerances with suppliers (high/low colour ranges). | As per agreed colour tolerances with suppliers (high/low colour ranges). |
| Spacing of Caps on Stick | | 8 - 11mm | 8 - 11mm | 9 - 11mm |
| Appearance | | Not damaged/crushed.<br>Not stuck together. | Not damaged/crushed.<br>Not stuck together. | Not damaged/crushed.<br>Not stuck together. |
| Seam | | Good adhesion.<br>No excessive glue. | Not Applicable. | Good adhesion.<br>No excessive glue. |
| Bottle Application | | No tearing/splitting.<br>No puckering/blistering/ripping.<br>No scuffing.<br>No upturned edges. | No tearing/splitting.<br>No puckering/blistering/ripping.<br>No scuffing.<br>No upturned edges. | No tearing/splitting.<br>No puckering/blistering/ripping.<br>No upturned edges.<br>No glue failure.<br>No seam opening up. |
| Length Per Stick | | Less than 600mm | Less than 600mm | Less than 600mm |

| Decorative Capsules continued… | | Recommendation/Observation | | |
|---|---|---|---|---|
| **Critical Issue** | **Description** | **PVC / PET / Spinnable Polylaminate** | **Metal** | **Polylaminate Sparkling Wine Hoods** |
| Packing | | Sticks packed horizontally. | Sticks packed horizontally | Sticks packed horizontally. |
| Identification Label | | Product description.<br>Quantity of capsules per carton.<br>Product code.<br>Job number.<br>Carton number. | Product description.<br>Quantity of capsules per carton.<br>Product code.<br>Job number.<br>Carton number. | Product description.<br>Quantity of capsules per carton.<br>Product code.<br>Job number.<br>Carton number. |
| Storage & Palletisation | Storage of capsules is critical to the stability and performance. Capsules handled and stored incorrectly can be damaged and not dispense automatically on line. | PVC must be stored in clean dry and cool environment. The capsules must not be stored with other goods or goods stacked on top which can damage the capsule. Ensure palletised cartons are placed onto pallets with no overhang. | Metal must be stored in clean dry and cool environment. The capsules must not be stored with other goods or goods stacked on top which can damage the capsule. Ensure palletised cartons are placed onto pallets with no overhang. | Capsules must be stored in clean dry and cool environment. The capsules must not be stored with other goods or goods stacked on top which can damage the capsule. Ensure palletised cartons are placed onto pallets with no overhang. |
| Usage | Maintenance and set-up of closure dispenser and heat unit (PVC) / spinning unit and rollers (Metal) / pleater and smoother (Poly) is critical to capsules performance. | The correct heat setting is critical to the capsules performance. Capsules are not to split or separate either during application or during the shelf life of the product. | Correct rollers and tension is critical to the capsules performance. | Pleaters and smoothers settings must be set to the correct pressure at start up to ensure no blistering occurs. |

| Sparkling Wine Muselet | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Dimension | Top Diameter:<br>Height: | Per product specification (+/- 0.5mm)<br>Per product specification (+/- 0.6mm) |
| Body Wire | Specification:<br><br>Galvanisation:<br>Purity Level:<br>Mechanical Strength: | Galvanised/Lacquered Wire Diameter: Free Belt: 0.95mm +/- 0.03mm Fixed Leg: 1.00mm +/- 0.03mm<br>Secure galvanised coating of at least 30gms/sqm<br>99.995<br>Minimal tensile strength: 19kgf<br>Minimal torsion for wire 210mm long: 44 rotations with a 4mm diameter ring. |
| Belt Wire | Specification:<br>Galvanisation:<br>Purity Level:<br>Mechanical Strength: | As per supplier specifications.<br>First fusion zinc (French Standard: NF A 91.131)<br>99.995<br>Minimal elongation: 18%<br>Minimal tensile strength: 28%<br>Minimal torsion for wire 210mm long: 44 rotations with a 4mm diameter ring. |
| Disk Steel | Tin Plated Steel:<br><br><br>Coloured Steel: | Thickness: 220µm +/- 30µm<br>Minimal tin coating: E = 2.8µm/2.8 µm (coated both sides)<br><br>Thickness: 210µm - 230µm<br>Colour coating:<br>1. Pre treatment varnish<br>2. Ink<br>3. Over coating varnish<br>Colour coating made on:<br>1. Electrolytic tin plated steel<br>2. Chromium tin plated steel |
| Spacing of Muselet on Stick | | Spacing pitch 5mm +/- 0.5mm |
| Appearance | | Packed to prevent damage and not damaged.<br>Crushed and not stuck together. |
| Bottle Application | | The bottling head twisting nose correctly set will apply and un-apply the muselet to a standard bottle for 2 full cycles, with a failure rate less than 5 per cent. |
| Length Per Stick | | Less than 600mm |

| Sparkling Wine Muselet continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Packing | | Sticks packed horizontally. |
| Identification Label | | Product description.<br>Quantity of capsules per carton.<br>Product code.<br>Job number.<br>Carton number. |
| Storage & Palletisation | Storage of muselet is critical to the stability and performance. Muselets handled and stored incorrectly can be damaged and not dispense automatically. | Muselets must be stored in a clean dry environment. Goods must not be stacked on top which can damage the muselet. Ensure palletised muselet are placed onto pallets with no overhang. |
| Usage | Maintenance and set up of muselet dispensers and applicators is critical to muselet performance. | Very light coating of food-grade oil to be applied to muselet during muselet manufacture, to assist running in muselet dispensers.<br>Important to rinse off muselet after application to bottle, as acidic wine content will dull the wire zinc finish. |

## 3. Labels

| | | Recommendation/Observation | |
|---|---|---|---|
| **Critical Issue** | **Description** | **Wet Gum** | **Pressure Sensitive** |
| Size | It is recommended that the maximum label dimension be restricted in height by 5mm at the top and bottom of the label panel to avoid puckering at the label extremities due to inconsistencies in application (especially for bottles with small label panels such as premium sparkling and burgundy bottles).<br>Label edges must be perfectly cut in accordance with Artwork specifications and free from burrs.<br>Wet Gum: Maximum tolerance for any label size on all directions shall be +/- 0.25mm. Maximum variance between smallest and largest label shall be 0.5mm.<br>Pressure Sensitive: Size variation is not applicable.<br>Distance between labels on a web shall be in accordance with labeller's manufacturer's specification or recommendation for the labelling machine.<br><br>Large labels are more susceptible to bubbling/creasing especially when applied to irregular/uneven bottles. Generally the larger the label the greater the risk. Large labels on uncoated paper increases the risk further. | Particular attention to die cut, rule cut, and guillotine cut labels. Attention should be taken to ensure variances do not occur too frequently in a bundle or batch. | Once a die or rule has been made there will be no size variation from that tool.<br><br>Trials should be conducted under production conditions to confirm that the large label can be applied adequately to achieve the desired aesthetics. |
| Colour | Labels shall lie between approved colour tolerances. Foil edges to be clean without chipping or feathering. | Colour specifications should be established from first print run and be agreed between printer and print purchaser. | Colour specifications should be established from first print run and be agreed between printer and print purchaser. |

| Labels continued... | | Recommendation/Observation | |
|---|---|---|---|
| **Critical Issue** | **Description** | **Wet Gum** | **Pressure Sensitive** |
| Label Integrity | Images shall be as per label Artwork approval. Text and legal requirements shall be as per Artwork approval. | Refer to specific National and International Regulations.<br>Refer to AWBC publications.<br>www.wineaustralia.com | Refer to specific National and International Regulations.<br>Refer to AWBC publications.<br>www.wineaustralia.com |
| Print Registration | Print registration movement shall not cause image distortion, colour shift or visual misalignment. | | |
| Adhesive | Adhesive shall not bleed from the interface between the stock and the backing medium. Select Adhesive for requirements. | | Adhesive should be selected based on requirements for aggression, repositionability, moisture resistance and specialized applications etc. eg, clarity when using clear plastic stocks requiring window effects. |
| Paper Grain | Grain is to be horizontal with the application orientation on the container. | ie grain should lay lengthways around the curve of the container and cause the label to curl top to bottom when wet. | |
| Embossing | Embossing is to be evident, in correct position and in accordance with the Artwork.<br>Grain emboss will reduce the surface area contact of adhesive to bottle.<br>A grain free border around the labels helps to maximise adhesive contact from the label edges to the glass, reducing the possibility of label edge lift.<br>Grained labels should be test applied to ensure edge lift does not occur and adhesion is sufficient. | Reference should be made to the colour specification for customer approval. | Reference should be made to the colour specification for customer approval.<br>Emboss should not be so deep that damage to the liner occurs.<br>A 3mm emboss/grain free border is recommended for maximising adhesive contact at the label edges for best adhesion |

| | | |
|---|---|---|
| Screen printing | Large areas of screen “varnish grain” create surface tension. Screen Grain labels should be test applied to ensure adhesion is sufficient and edge lift does not occur. | The Packaging Committee highly recommends that if screen printed bottles are required by a Company, they seek professional advice from their glass and screen printing suppliers to ensure fit for purpose for the production process, retailer and customer. |

| Labels continued... | | Recommendation/Observation | |
|---|---|---|---|
| **Critical Issue** | **Description** | **Wet Gum** | **Pressure Sensitive** |
| Neck Labels/Strips | Uncoated paper should be avoided as lifting/pinging can occur. Permanent adhesive should be used for all necks. Non-Varnish (Reverse Glue Flap) to be provided for overlap of wrap around necks. | | Permanent adhesive should be used. Non-Varnish (Reverse Glue Flap) to be provided for overlap of wrap around necks. |
| Storage & Conditioning | Labels are to be delivered supported, bound and shrink wrapped. Store in a stable environment. | All care to be taken to avoid extremes of humidity variation to allow labels to stabilize moisture content thus avoiding bending and movement of the stock.<br>Labels should be delivered at least 24 hours before use and stored in similar conditions to the applicator environment to ensure they are stabilized to the same temperature conditions. | All care to be taken to avoid extremes of humidity variation to allow labels to stabilize moisture content thus avoiding bending and movement of the stock. Labels should be delivered at least 24 hours before use and stored in similar conditions to the applicator environment to ensure they are stabilized to the same temperature conditions. Remove from sealed packs only as required to load applicator. |
| Release Liner | Release Liner must remain uniform in colour for total production run.<br><br>Labels shall not pre-release from the Release Liner Release Liner shall not break during the application process.<br><br>Different material is available. Please consider the environmental impact as only some Release liners are recyclable. | | This shall not occur during storage or in the application process. |

| Labels continued... | | Recommendation/Observation | |
|---|---|---|---|
| **Critical Issue** | **Description** | **Wet Gum** | **Pressure Sensitive** |
| Scuff Resistance | Labels should be resistant to label damage during transit. | Labels should be fit for purpose and not scuff during application, packaging, storage or transit. Refer to label printer for test details and requirement for trialling if required and request particular attention when divider-less shippers are used. | Labels should be fit for purpose and not scuff during application, packaging, storage or transit.<br>Refer to label printer for test details and requirement for trialling if required and request particular attention when divider-less shippers are used. |
| Paper Selection | Stock to be compatible with labelling machines, adhesives and application speed.<br><br>Moisture integrity should be considered when selecting paper stock | Trials should be conducted under production conditions to confirm compatibility of unproven stocks to the conditions of each bottling line. Where labels are required to be submitted to high humidity and wet conditions, trials should be conducted on printed and varnished stock to ensure they meet expectations under these adverse conditions. | Trials should be conducted under production conditions to confirm compatibility of unproven stocks to the conditions of each bottling line. Where labels are required to be submitted to high humidity and wet conditions, trials should be conducted on printed and varnished stock to ensure they meet expectations under these adverse conditions. |
| Packaging of Labels | The packaging of labels should be discussed with your label supplier. Different methods of packaging are available.<br>Bulk bins, individual packaged or shrink wrapped rolls are the most common forms of packaging.<br>Each of these types of packaging may have an impact on your storage, WHS or environmental systems. | Ensure that labels are packed in bundles | |

| Labels continued... | | Recommendation/Observation | |
|---|---|---|---|
| **Critical Issue** | **Description** | **Wet Gum** | **Pressure Sensitive** |
| Roll direction | The roll direction should be selected as per your labelling machine suppliers specification | | Select and specify the correct roll direction applicable to your labelling machine. |

## 4. Cartons

Corrugated and Pre-Print Fibreboard Cartons

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| Carrying Capacity | Performance: For any box to provide satisfactory service in the field depends upon many factors.<br>It is necessary to match the function of the carton to the nature of the contents, and the relevant distribution system (handling processes). | For decision (6 pack versus 12 pack) please consider the following points<br>• Customer specifications<br>• OH&S considerations<br>• Packing efficiencies<br>• Palletising efficiency<br>• Product damage during transport<br>• Cost of the packaging<br><br>Further Reference: AS 2400 (1986) |
| Carton type | Different carton types are available for use<br>• RSC Carton<br>• Laydown cartons<br>  • Different configurations<br>  • 2 x 3<br>  • 1 x 6<br>  • 2 x 6 etc.<br>• Wrap around carton | For decision (Carton Type) please consider the following points<br>• Customer specifications<br>• OH&S considerations<br>• Pack stability<br>• Packing ability and efficiencies<br>• Palletising efficiency<br>• Product damage during transport<br>• Cost of the packaging<br>• Type of insert /dividers<br><br>Supplier/client negotiation - fitness for purpose. |
| | | |

| **Cartons continued…** | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Size | Panel Sizes:<br>Slotting Position:<br><br>Under/Oversize Slotting:<br><br>Height:<br>Other: | Panel size of +/- 1mm with no more than 3mm accumulated.<br>Slotting position +/- 3mm from the centre of crease and clean cut slots.<br><br>Under/Oversize slotting +/- 2mm unless specified (the aim is 3mm past the score line).<br><br>Height +/- 2mm Centre of slot to line up (same plane).<br><br>Minimal evidence of torn edges of board as a result of blunt cutter blades. |
| Corrugated Glue Bond Strength | Corrugated glue bond strength is measured by the liner adhesion test. | Reference: AS 1301.430s<br>Note: Where A, B, C R or I flute are used, the liner adhesion shall not be less than 0.5 kN/m of flute. |
| Board Material - Flute Grade to be Specified. | Cartons shall be constructed from A, B, C, R or I flute single wall, double wall or triple wall corrugated fibreboard.<br><br>**LCBO requirements**<br>Shipping container material must be recyclable. | As per negotiated specification between supplier and client.<br>Thickness: 2.4mm - 4.2mm<br>Paperweight to be negotiated between supplier/client to performance.<br><br>**LCBO requirements**<br><br>Full details of requirements are available at LCBO Product Packaging Standards – www.LCBOtrade.com. |

| **Cartons continued…** | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Crush | | To be specified between supplier/client.<br>Overall non print area 0.2mm<br>Printed area 0.3mm<br>Pull straps, folding belts 0.25mm<br>( pending on board combination and art work requirements ) |
| Cartons Containing Glass Bottles | **LCBO Requirements**<br>Single wall cartons (A or C flute) must have burst strength capacity of ≥ 175 psi as tested by the Mullen Burst Strength Test or 32 ECT<br><br>Double wall cartons (B or C flute) must have burst strength capacity of ≥ 175 psi as tested by the Mullen Burst Strength Test. | Refer to LCBO Product Packaging Standards at www.LCBOtrade.com for complete requirements.<br>Approved board grades are Z107A from Amcor Fibre Packaging and 625WK-B(2) from Visyboard, for cartons up to 22 kg.<br><br>Refer to LCBO Product Packaging Standards at www.LCBOtrade.com for complete requirements. |
| Print Quality | Colour (cartons shall be between colour tolerances):<br><br>Register (colours and print):<br><br>Appearance/Neatness (imperfections shall be eliminated ie Smear/Offset/Spattering/Imperfections)<br>Stereo Placement/Alignment: | Colour: specifications should be established, and agreed between supplier and client using PMS standards.<br>Registration: specifications for register +/- 2mm for each colour and +/- 3mm registration print to each carton.<br>Appearance: specifications should be established between supplier and client.<br>Stereo Alignment: specifications should be established between supplier and client (printing should be squared to the carton panel(s) within +/- 6mm). |
| Pre-print/Gloss Cartons | Top and Bottom long flaps:<br>Gloss Varnish: | A minimum gap of 4mm +/- 2mm.<br>Specifications to be set by supplier / client; however no gloss prints to occur on internal flaps (glue sealing surfaces). |
| Presentation/Integrity | Text and Images shall be as per approved artwork, inclusive of legal requirements. | Text and images should be established and agreed between supplier and client<br>Refer to Domestic and International regulations (FSANZ). |
| Quantity/Palletisation/Delivery | | To be agreed between supplier and purchaser, inclusive of shrink or stretch wrap - to reduce moisture changes or possible contamination/damage during storage and distribution. |

| **Cartons continued…** | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Supplier Identification | Supplier /Pallet Identification | Each carton should have supplier identification and production details. |
| Storage Conditions | Critical to the aesthetics and performance of the carton. | All cartons must be stored in a clean and dry environment.<br>Store in temperatures above 5 degrees and Below 35 degrees.<br>Excessive dry/wet conditions should be avoided – air humidity affects the material and the usability of the carton. Further reference: Australian Standards. |
| Quality Levels | AQL Standards | Such specific level can be set to standard AQL levels of Non-conformance. These will need to be agreed between supplier and client. |
| Specifications for general purpose corrugated fibreboard boxes and blanks | Definitions/Descriptions and Terminology | Reference: AS 3537-2006<br>No warped/boxed cartons for automated packaging<br>No excess glue to glue lap causing cartons to stick together<br>No fishtailing, no more than 3mm variation between top and bottom of glue lap<br>Washboarding is unacceptable<br>Cartons to be presented the same way, in bundles for automated packaging or mechanical use<br><br>( All above, levels to be agreed to between purchaser and supplier ) |

## 5. Bag-in-Box / Softpack

| Plastic or Metallised Plastic Wine Packs with Dispensing Tap | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Oxygen Transmission - Tap | The tap component can significantly impact on oxygen transmission rate (OTR). | Destructive oxygen transmission measurements can be carried out according to measurement standards ASTM1307[4] or ASTM1927[5]. |
| Flow Rate – Tap | Operation of tap should be simple to use with a good flow rate. | It should be expected that a standard drink can be dispensed in less than 5 seconds. |
| Handling & Storage | Consideration needs to be given to the handling and storage of bags prior to production as excessive heat can cause the taps to deform and degrade the bag material | Recommendation that all bags are transported and stored out of direct sunlight or radiant sources of heat & in a dust free area. |
| Oxygen Transmission - Cask Film Material | Unlike glass, plastic films allow oxygen to permeate through their structure. The oxygen transmission rate is quoted as cc oxygen/square meter /24hrs. As films are flexed their oxygen transmission rate increases. | When comparing film structures always use measurements of pre-flexed films. Measurements can be carried out using ASTM D3985[6]. OTR can be also be measured non-destructively through a clear section of the barrier film[3]. |

[6] ASTM D3985 Standard Test Method for Oxygen Gas Transmission Rate Through Plastic Film and Sheeting Using a Coulometric Sensor

| Plastic or Metallised Plastic Wine Packs with Dispensing Tap continued.. | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Flex-Cracking | Plastic films can "crack" due to flexing during the packing and transport of softpacks. This cracking increases the oxygen transmission rate of the film and in extreme cases can lead to leakage. | During packing, the pouches need to be handled with care to minimise shocks and excessive flexing. |
| Box-Pouch Compatibility | The size and dimensions of the cardboard cask box and the pouch are interdependent and will affect the performance of the whole package. Flex-cracking and pack deformation can be improved by optimising the compatibility of the sizes. | Your pouch supplier should provide you with the optimum size combination for you to consider. Design of box should be such that the bag is not exposed to sharp edges of board form die cutting during loading and transport |
| Wine Preservatives | Due to the oxygen permeability of the pack particular attention needs to be paid to preservative levels at filling to maximise the shelf-life of the pack. | |
| Dissolved Gases – Carbon Dioxide and Oxygen | Wine contains dissolved carbon dioxide in various quantities. If the level is high at filling the gas can come out of solution during transport and storage causing the bag to balloon (and in extreme cases burst).<br>Dissolved Oxygen can be detrimental to the quality of the product. | Typical dissolved carbon dioxide ($CO_2$) levels at bottling are less than 0.7grams per litre. $CO_2$ should be measured prior to and after filling. Dissolved $CO_2$ should be measured before and after filling, on pre-chilled wine samples. Filling temperature can influence the resulting concentration of $CO_2$ in the packaged wine.<br><br>Dissolved Oxygen should be as low as possible to extend the shelf life of the product. Excess oxygen can result in premature aging resulting in colour changes (browning), flavour loss and the development of undesirable faults, leading to reduced shelf life.<br><br>Total package oxygen (TPO) levels should be measured during packaging to ensure that $O_2$ pick-up is controlled to a minimum and total oxygen in the package is minimised. |

| | | |
|---|---|---|
| Best Before Dates | Softpacks are required by law to carry "Best Before" dates, as does any product which has a shelf life of less than two years. | Product trials should be conducted to determine appropriate best before dates as wine life may be effect by wine chemistry, preservative levels, sanitation, exposure to heat and transport. |
| Bag Strength | A function of the cask film material | Determined by performing sustained and burst pressure testing. A 'drop' test may be used as an indicator of strength. |

## 6. General Product Specifications

| **Plastic or Metallised Plastic Wine Packs with Dispensing Tap continued..** | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| General | Customers will require a full product specification. | |
| Bottle Shape & Style | This will indicate if the production line has the capabilities to run it down the line.<br>Glass label panel will dictate the label sizes and shapes appropriate for bottle.<br>Neck finish will dictate the closure that can be applied, namely screwcap, cork length and diameter, capsule; PVC, PET, tin diameter and length .<br>Size and shape of the carton needed. | Obtain bottle drawings that include required (critical) dimensions. |
| Carton Shape/size | Will depend on the quantity of bottles required for packaging i.e. gift box, 6 pack, 12 pack, cluster pack, divider<br>Bottle shape and size. | Customer specific market requirement.<br>Length by width by height and weight will be required by customers. |
| Carton Orientation (Upright/Laydown) | Closure used on bottle has an important impact on bottle orientation required for storage and transport. | Carton orientation may be required by customers and be customer or brand specific. |
| Pallet Configuration | Carton stacking and palletisation is determined by the type of bottle and the carton used.<br>Pallet configuration will be required by customer specification. | Refer Correx palletising chart. |
| Slip Sheet | Required for some customers to aid depalletisation. | Size and thickness of slip sheet will be determined by pallet size, pallet configuration and carton weight. |
| Carton Identification (Stencil/Sticker) | Is a mandatory requirement, artwork will need to include specific mandatory details or an un-printed area for ink jet application or stickers. | Customer specific requirements.<br>Warehouse handling requirement.<br>Legal and mandatory requirements for different markets |

| General Product Specifications | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Divider | Used as an aid for carton stabilisation and to help minimise label damage – optional<br><br>**LCBO requirements**<br>Dividers must provide adequate protection against damage or breakage and must prevent direct bottle to bottle contact.<br><br>Dividers must be secure when carton is inverted. | Recommended for all sparkling products, cartons that are designed for lay down or inverted bottles, multi-packs ie 24x single serve bottles, brandy. Refer to the Export Market Grid USA and Canadian requirements. www.wineaustralia.com and www.LCBOtrade.com<br><br>Dividers must not be less than full shoulder height of the bottles. Refer to LCBO Product Packaging Standards at www.LCBOtrade.com for complete requirements.<br><br>Requirement can be achieved by at least 1 piece of the corrugated/solid fibreboard extending to the full height of the carton or by adhesive bonding the divider to the inner surface of the carton (i.e. OTOR style divider). Refer to LCBO Product Packaging Standards at www.LCBOtrade.com for complete requirements. |
| Top Pads | **LCBO requirements**<br>A top pad is a corrugated or solid fibreboard sheet used for extra protection or for separating tiers or layers of articles within a carton. | All wines packaged in an inverted bottle position require a top pad inserted between the tops of the bottles and the 2 inner flaps of the shipping container, or the 2 inner flaps and 2 outer flaps of the carton must meet in the centre. Refer to LCBO Product Packaging Standards at www.LCBOtrade.com for complete requirements. |
| Carton Strength | A function of the corrugated flute and liner used. | Determined by carton weight and orientation.<br>Customer requirement. Product security ie sparkling cartons are generally stronger. |
| Barcode Requirements | A standardised approach to numbering and bar coding trade items. | Refer to GS1 Australia User Manual - Numbering and Bar coding - www.gs1au.org/index.asp |

| General Product Specifications continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Mandatories / Sparkling Warnings / Display | Carton artwork to consider bottle orientation symbol, Stanley knife warning, carton display cuts.<br>Using 6 pack cartons as a retail unit. | Product specific.<br><br>If a customer requires a 13 digit barcode on a pack, ensure relevant labelling mandatory requirements for retail packages are met. Refer to AWBC Wine Label Law for these requirements. www.wineaustralia.com |
| Mandatories | Using six & 12 pack cartons as a retail unit | If a customer requires a 13 digit barcode on a pack, must ensure relevant labelling mandatory requirements for retail packages are met. Refer to AWBC label law for these requirements. www.wineaustralia.com |
| Capsule | Composition of capsule is determined by product design or customer requirement (some require capsules to be PET for recycle). | Capsule composition will be determined by customer specifications. |
| Neck Tags / Accessories | A promotional item that can be applied to individual bottles.<br>Number applied per carton is limited to line capabilities. | Promotional requirement. |

## 7. Glass Bottles

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| Dimensions | The specific measurements of a bottle either by physical measurement and / or from the suppliers approved drawings | Glass bottle dimensions shall be as per approved drawings (commonly known as “ware specs”) provided by their suppliers. |
| Finish | The specific glass finish affects type, style and size of closure usage.<br>The most common finishes available for the Australian domestic and export markets are “cork mouth”, “BVS”, and Crown/Sparkling. | The finish of each bottle shall be as per approved manufacturer drawings & shall perform with the appropriate/specified closure. The sealing surface/s on all bottles must be smooth & undistorted and within the specified tolerances. |
| Capacity | Bottle capacities do vary from that nominated/specified (i.e. 750ml) due to manufacturing variances, however actual capacity must be within the specified/acceptable tolerances. | Any measurement of bottle capacity must be in accordance with either the minimum fill system or the average quantity system<br>For more information on trade measurement legislation, contact National Measurement Institute – www.measurement.gov.au |
| Exterior Surface Coating | Bottles are coated to inhibit scuffing during transport. | Minimal scuffing should exist. Excess surface coating can lead to poor label adhesion. |
| Label Panel | Sink & Bulge | Maximum 0.1mm per 25mm length of label panel to a maximum of 0.5mm |
| Bottle Colour | Bottle colour does vary during manufacturing within a specified range (refer supplier specifications and tolerances). | Bottle colour must be within the specified supplier range unless notified by the supplier, and agreed to use. |
| Glass Contaminants | The manufacture, handling and transport of glass bottles can contribute to the inclusion of physical contaminants glass fragments in containers. | Bottles supplied that contain contaminants such as glass fragments are classified as critical defects.<br>## (This reinforces the importance of bottle rinsing prior to use and monitoring the condition of pallets on arrival. ) |
| Lot Marking | Glass pallets should be labelled with manufacturing time and batch-lot numbers and plant reference code/s | During usage, pallet numbers and production dates should be recorded to assist with traceability. |

| Glass Bottles continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Handling & Storage | Storage is critical to the performance of bottles. | Ideally glass bottles should be stored under cover. Where possible, glass should be supplied to the bottling line at a consistent temperature<br>*Note: the closer to the wine fill temperature the better.* |
| Packing | Pallets, divider board and wrapping can deteriorate over time.<br>*Note: As there is a cost and return associated with this packing material care should be taken to avoid any damage.* | When using glass, particular attention should be paid to the dividers. Pallets and dividers must be free of foreign materials, pests and dust.<br>*Note: Stacked dividers boards must be stored whilst awaiting collection.* |
| Critical Defects | Unacceptable. Defect that are likely to result in a health risk. | Defects include, but not limited to, are Bird swing, loose glass internal, external stuck glass, internal fused glass, overpressed finish, stuck plunger, sugary finish, open internal blister, carbon or any foreign objects, any other defects that could be hazardous to a consumer. Any object that is likely to result in glass/product contamination, failure of pressure bottles or that could be considered hazardous to a consumer should not be used. |
| Major Defects | Any functional defect that may cause the container to fail. | Defects include line over finish, split ring, chipped finish, offset finish, choked neck, body check or split, sloping finish, out of round or oval, split seams, crizzled finish, stones (stressed) split bottoms, split seams, air marks, any other defects that may result in container failure, disruption to bottling or closure application.. |
| Minor Defects | Any defect that is generally aesthetic in nature, but does not affect the functionality of the container. | Defects include colour off standard, wave laps, wash board, brush marks, loading marks, knurling, excessive coating, slug necks, sunken ware, cold wave, take out check, hard blisters, any other defects that noticeably affect appearance and may affect stability. Any defect that does not impact on the function of the container but is a departure from acceptable standards and appearance. |

## 8. PET Containers

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| Dimensions | | PET bottle dimensions shall be as per approved drawings. |
| Finish | | The finish of each bottle shall be as per approved drawings & shall perform with the specified closure. The sealing surface on all PET bottles must be smooth & undistorted. |
| Capacity | | Brimful capacity & fill point tolerances shall be as specified on approved drawings. Suppliers must ensure PET bottles supplied can maintain Australian fill requirements. For more information on national trade measurement legislation contact National Measurement Institute. www.measurement.gov.au |
| Foreign Objects | | PET bottles supplied that contain any foreign material should not be accepted. |
| PET Supplier Container defects | Any defects that is visual or has an affect on the performance or appearance of the container | Colour off standard, any defects that noticeably affect the appearance and may affect stability. Any defect that does not impact on the function of the container but is a departure from acceptable standards and appearance. |

| PET Containers continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Storage and transport of empty bottles. | Keep away from heat sources. | The effects of heat can range from minor distortion of the bottle panels to shrinking and gross deformation rendering the container unfit for use. Pallet wrap must ensure bottles are stable during shipment & storage. The tension in the wrap should be firm but must not damage bottles.<br><br>Transport conditions can cause scuffing on PET bottles and they should be routinely checked at delivery.<br><br>Seek Suppliers recommendations for appropriate transport conditions. These must be followed to prevent damage to the bottle during transport |
| | Products must be stored inside | Never leave Products in direct sunlight. (even on a cool day)<br><br>Store your Products in a cool dry location. The formation of condensation in the shrink-wrapping or in individual containers can occur if stored in a humid environment.<br><br>Do not exceed the recommended pallet stack height.<br><br>Seek Suppliers recommendations for appropriate storage conditions. |

| PET Containers continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| | Manage stock rotation | First in first out.<br><br>Be aware that the shelf life of the package can start deteriorating from the manufacture of the bottle depending on the oxygen scavenger used.<br><br>Suppliers will be able to supply information on shelf life.<br><br>Pallet tickets should state no exposure to sunlight heat or moisture. This will alert forklift drivers to the proper handling process.<br><br>. . |
| **On the packaging line.** | | |
| | | Ensure that pallets, layer pads and bottles are compatible with your packaging technology.. |
| | Conveyer Scuffing | Care must be taken to ensure that PET bottles do not remain on a moving conveyor during extended production stops – Conveyors should be switched off or bottles removed from the line. Conveyors should preferably be non-Stainless to reduce possible PET damage. |
| | | |

| PET Containers continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Traceability | | The supplier is required to maintain records to identify all delivery batches & production dates. |
| Product Identification & Traceability | | A best before date is required.. .<br>Reference Standard 1.2.5 Date Marking of Packaged Food. |
| Warehousing finished product | | Refer to the Suppliers recommendations in relation to the maximum finished product pallet height. |
| Stock rotation | | Ensure oldest stock is used first, (first in first out) |
| PET Type | | PET containers are available with different 02 scavengers and barriers these assist in extending the shelf life of the packaged product.<br><br>Consult with your PET supplier on the most appropriate options for your products. |
| Filling & Capping Machine Set up | Critical, correct filling & capping machine set. | Consult with bottle supplier as to the correct filling & capping machine set up.<br><br>Trial bottles on equipment to ensure equipment is capable of handling PET.<br><br>Ensure that the cap applicator can perform at the stated top pressure for the bottle. If a counter pressure filler is being used ensure that the pre-evacuation has been turned off otherwise the bottle will implode. Bottle flushing to expel air will then be required. |

# 9. Aluminium can packaging

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| Dimensions | The aluminium can consists of two structural elements formed together to create a sealed package: The can body and the can end (lid). Aluminium can bodies are typically categorised into three categories: Slim, Sleek or Classic. Each category has differing dimensions and requires correct alignment with the can end.<br><br>The most common canned body used in the Australian market is a Slim line 250mL can, with a 200 or 202 can end. | Aluminium can dimension shall be as per approved drawings. Supplier led assurances are required to determine whether the product is appropriate for the packaging line. |
| Barrier Films | The internal coating, or barrier film (lacquer) applied to an aluminium can package is a protective element to prevent direct contact between the aluminium and certain wine constituents. The internal coating is applied to the internal surface of each of the two structural elements of the can. | The internal coating of each aluminium can should be agreed upon with the supplier prior to use. Wine is generally classified as a “hard-to-hold” beverage; hence the internal coating should generally be applied as a thicker film weight. Typical internal lacquers are comprised of epoxy resins. Supplier led corrosivity testing or testing through an analytical service provider can help to define a wines risk of failure in the aluminium can format |
| Product based risk factors | Certain wine characteristics can pose a risk for corrosion in can, leading to an increase in aluminium levels and the development of reductive aroma’s (notably hydrogen sulfide) due to the interaction with aluminium. | Based on supplier led testing, known risk factors for canned wine include:<br>• High sulfur dioxide levels.<br>• High copper concentration<br>• High chloride concentration<br>• High sulfate concentration<br>• Low pH<br>Supplier stated levels should be maintained and checked through analytical testing prior to packaging. |
| Fill Height and Overpressure | Specified fill heights for still and carbonated beverages in aluminium cans and internal pressure requirements (either $CO_2$ or $N_2$) to help support the products through | Brimful capacity & fill point tolerances shall be as specified on approved drawings. Suppliers must ensure that aluminium cans supplied comply with Australian fill requirements. The large headspace to wine volume |

| | | |
|---|---|---|
| | the supply chain. | ratio in a canned wine product makes canned wine especially susceptible to oxidation if the headspace contains air. Liquid nitrogen is recommended to displace the air in the headspace post-filling of still wines, providing sufficient over-pressure for can structural integrity and subsequent storage and transport. Sparkling wines are typically not sparged post-fill due to the over-pressure achieved with the $CO_2$ and $O_2$ displacement by the $CO_2$ in the headspace.<br><br>For more information on national trade measurement legislation contact National Measurement Institute. www.measurement.gov.au |
| Foreign Objects | | Aluminium cans supplied that contain any foreign material should not be accepted. |
| Seam Specification | The can body and can end undergo a seaming process to ensure an effective seal preventing air ingress and wine loss. | Can seam specifications shall be as the approved drawings. Specific components (i.e. cover hook, body hook) will have tolerances set by the can suppliers. Measurement should be completed prior to commencement of a packaging run. |

| Aluminium cans continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Handling and storage | The can body is coated with an over varnish which helps improve mobility and handling during manufacturing and filling while contributing to protection from external corrosion and scuffing. | The stacking and packaging of filled cans should be carefully considered to ensure cans are not dented, impacting the internal lacquer.<br>Pallets that provide an even base and do not have any protruding elements (nails) are essential.<br>Bottom layer pads and separation sheets between layers of cans can help distribute the weight and prevent supply chain damage.<br>Stretch wrapping of pallets to prevent movement of cans during transport is critical. Cans must remain completely dry due to corrosion issues. Leaking cans need to be removed from the bulk storage immediately and any exterior surface in contact with wine needs to be rinsed with clean water and be allowed to dry completely to prevent corrosion throughout stock. |
| | Products must be stored inside | Products should not be stored in direct sunlight (even on a cool day).<br>Store cans in a cool dry location. The formation of condensation in the shrink-wrapping or in individual containers can occur if stored in a humid environment and can ignite and exacerbate corrosion.<br>Do not exceed the recommended pallet stack height.<br>Seek suppliers' recommendations for appropriate storage conditions. |

| Aluminium cans continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| | Manage stock rotation | First in first out.<br><br>Be aware that the shelf life of the package can start deteriorating from the manufacture of the can depending on the barrier film used.<br><br>Suppliers will be able to supply information on shelf life of the can.<br><br>Pallet tickets should state no exposure to sunlight, heat or moisture. This will alert forklift drivers to the proper handling process. |
| **On the packaging line.** | | |
| Dry Goods | | Ensure that pallets, layer pads, can bodies and can ends are compatible with your packaging technology. |
| Conveyer Scuffing | - | Care must be taken to ensure that aluminium cans do not remain on a moving conveyor during extended production stops – Conveyors should be switched off or cans removed from the line. Conveyors should preferably be non-Stainless to reduce possible can damage. |
| Sanitation | - | A strict sanitation protocol should be implemented at the canning facility to ensure clean equipment. |

| Aluminium cans continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Traceability | | The supplier is required to maintain records to identify all delivery batches & production dates. |
| Product Identification & Traceability | | A best before date is required.<br>Reference Standard 1.2.5 Date Marking of Packaged Food. |
| Warehousing finished product | | Refer to the Suppliers recommendations in relation to the maximum finished product pallet height. |
| Stock rotation | | Ensure oldest stock is used first, (first in first out) |
| Aluminium can type | | Aluminium cans are available with different barrier films which assist to prevent corrosion and assist in extending the shelf life of the packaged product.<br><br>Consult with can supplier on the most appropriate options for your products. |
| Filling & Seaming Machine Set up | Critical, correct filling & seaming machine set. | Consult with can supplier as to the correct filling & seaming machine set up.<br><br>Trial cans on equipment to ensure equipment is capable of handling can bodies and ends from multiple suppliers.<br><br>Ensure that the can seamer can perform at the stated top pressure for the aluminium package. |

## . Packaging Usage & Safety

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| General | The primary purpose of these packaging guidelines is to offer guidance for what is considered industry best practice for those companies who procure and use packaging. | Reference should always be to suppler specifications for usage.<br>• Weights / Dimensions for both manual handling, storage and to suit any customer equipment<br>• Palletisation configurations / method / stability<br>• Protection from environmental factors during storage and transport<br>• Supplied in a configuration that matches customers process capability<br>• Objective should be to minimise waste within packaging |

| Packaging Usage & Safety continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Product Identification | Identification labels should be mandatory for all packaging deliveries. | Each pallet must show all of the following information:<br><br>• Customers Item Number<br>• Customers Order Number<br>• Brief Component Description including brand<br>• Number shippers on pallet<br>• Number items per shipper and for pallet<br>• Sequential case number or time of production<br>• Production date<br>• Suppliers name & location<br>• Customer specified barcode<br><br>Each shipper must show all of the following information<br><br>• Suppliers name & location<br>• Customers Item Number<br>• Customers Order Number<br>• Brief Component Description including brand<br>• Number of items per case<br>• Case Weight<br>• Sequential case number or time of production<br>• Production date<br>• Customer specified barcode<br><br>. |
| Packaging Usage | Documentation of the usage of packaging is an important process to comply with Australian and international product traceability requirements. | Systems to record and maintain the usage of packaging should be incorporated in the company's packaging operating procedures.<br>• Traceability to batches / productions / shifts<br>• Match to supplier batches and production dates<br>Storage methods & duration with aim to operate within FIFO principles. |

## 10. Packaging Usage & Safety

| Critical Issue | Description | Recommendation/Observation |
|---|---|---|
| General | The primary purpose of these packaging guidelines is to offer guidance for what is considered industry best practice for those companies who procure and use packaging. | Reference should always be to suppler specifications for usage.<br>• Weights / Dimensions for both manual handling, storage and to suit any customer equipment<br>• Palletisation configurations / method / stability<br>• Protection from environmental factors during storage and transport<br>• Supplied in a configuration that matches customers process capability<br>• Objective should be to minimise waste within packaging |

| Packaging Usage & Safety continued… | | |
|---|---|---|
| **Critical Issue** | **Description** | **Recommendation/Observation** |
| Product Identification | Identification labels should be mandatory for all packaging deliveries. | Each pallet must show all of the following information:<br><br>• Customers Item Number<br>• Customers Order Number<br>• Brief Component Description including brand<br>• Number shippers on pallet<br>• Number items per shipper and for pallet<br>• Sequential case number or time of production<br>• Production date<br>• Suppliers name & location<br>• Customer specified barcode<br><br>Each shipper must show all of the following information<br><br>• Suppliers name & location<br>• Customers Item Number<br>• Customers Order Number<br>• Brief Component Description including brand<br>• Number of items per case<br>• Case Weight<br>• Sequential case number or time of production<br>• Production date<br>• Customer specified barcode<br><br>. |
| Packaging Usage | Documentation of the usage of packaging is an important process to comply with Australian and international product traceability requirements. | Systems to record and maintain the usage of packaging should be incorporated in the company's packaging operating procedures.<br>• Traceability to batches / productions / shifts<br>• Match to supplier batches and production dates<br>Storage methods & duration with aim to operate within FIFO principles. |

## Additional Information

Further Information and useful resources are available at the following sites:

Grower Guide to Label Integrity Program – Wine Australia

Packager's guide to the Label Integrity Program – Wine Australia

Size Me Up (Wine Sector guide to label dimensions) - Wine Packagers of Australia