

The Australian Wine Research Institute



The Code of Good Manufacturing Practice for the Australian Grape and Wine Industry

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Table of contents

	<i>page</i>
1	Introduction 2
2	The concept of good manufacturing practice 2
2.1	The Code of GMP for the Australian grape and wine industry 4
2.2	GMP documentation and records 5
3	GMP recommendations 5
3.1	General 5
3.1.1	<i>Management</i> 6
3.1.2	<i>Employee practices</i> 7
3.1.3	<i>Records</i> 8
3.1.4	<i>Finished product</i> 9
3.2	Environment and facilities 10
3.2.1	<i>General</i> 10
3.2.2	<i>External</i> 10
3.2.3	<i>Internal</i> 11
3.2.4	<i>Equipment</i> 12
3.3	Production 14
3.3.1	<i>Raw materials</i> 14
3.3.2	<i>Equipment</i> 15
3.3.3	<i>Grapegrowing</i> 16
3.3.4	<i>Grape harvesting</i> 17
3.3.5	<i>Winemaking</i> 18
3.3.6	<i>Laboratory</i> 19
3.3.7	<i>Packaging operations</i> 20
3.3.7.1	Bottling hall procedures 21
3.3.7.1.1	<i>Broken glass handling</i> 21
3.3.7.1.2	<i>Bottling</i> 22
3.3.7.1.3	<i>Bag-in-box</i> 23
3.3.8	<i>Rework, quarantine and product recall</i> 24
3.4	Storage and distribution 24
4	References 25

1 Introduction

The following Code of Good Manufacturing Practice (GMP) has been prepared by The Australian Wine Research Institute and is based on that developed in New Zealand (Reeves and Fraser 1995). It is not intended to be an instruction manual on grapegrowing or winemaking. Its main purpose is to outline the basic practices that should be followed in vineyards and wineries to ensure that safe and sound quality products result. Safe refers to both the environment and the consumer.

GMP is a statement of some generally accepted procedures that should be instituted throughout the Australian wine industry. The adoption of GMP will facilitate the development and introduction of quality management and food safety programs, such as Hazard Analysis Critical Control Point (HACCP)-based food safety programs.

While GMP can be viewed as a starting point for development, it should not be considered as having the same function or orientation as food safety and quality management programs.

2 The concept of good manufacturing practice

The concept of GMP is becoming more recognised and respected. Whilst having no legal status in Australia, some countries, such as the USA, have codes incorporated in their food law. GMP is useful in the development of HACCP-based food safety programs, ISO 9000 programs and total quality management (TQM) programs. This is because some failures in GMP can result in hazards to food safety or quality occurring.

GMP alone is not a HACCP analysis, nor a quality assurance (QA) system and not a TQM program. It cannot, by itself, guarantee the safety of a product at the time of consumption. GMP primarily applies to the processing practices within the business itself and a Code of GMP

suggests what is required rather than how they should be achieved. In contrast, HACCP programs represent a 'how to' approach by analysing the hazards and risks, and then formulating the controls for critical hazards. Therefore, the Code of GMP presented here should be regarded as a bare minimum for each company to adopt.

In addition, because a GMP cannot be site-specific, the Code presented here is generalised and requires other documentation that provide details of company policy and practice. Indeed, GMP can be considered as a broad code of conduct for grapegrowing and winemaking on which other particular procedures (or work instructions) appropriate to a specific site should be based.

IMPORTANT NOTE *At all times the vineyard and winery should comply with all relevant legal requirements in force at the time of grapegrowing and winemaking. The Code of GMP is not an interpretation of legislation.*

Commonly, contracts are written where it is stated that raw materials should be produced under conditions of 'good manufacturing practice'. Such vague terminology can make disputes hard to resolve, but in Australia there have been successful court cases where one party has sought recompense from another because of problems that arose through goods being produced under conditions that were not commensurate with 'good manufacturing practice'.

The Australian Wine Research Institute has developed this Code as a guide to allow individuals in the industry to make their own interpretation of practices they wish to adopt. By observing GMP, it is generally believed that both employers and employees will strive to operate the business in an acceptable, hygienic and safe manner.

GMP is also one of the corner stones of a full QA system, and is an integral part of a food safety program. However, because many QA systems are not comprehensive, aspects of GMP may be missing in many

companies. By having a separate GMP statement, companies can articulate to employees in a general way the type of practices that are acceptable and those that are not.

Some companies may wish to issue booklets to all employees summarising the company's GMP policy. Such booklets can also be used to spread the company 'mission' statement, but are of little use if they just remain on the shelf, are ignored, and not put into practice. GMP, like QA, requires commitment and support from all levels of management.

Some companies provide their suppliers with copies of their GMP policy and require them to follow those practices. Others use their GMP policy as a selling point to demonstrate to customers the principles on, and practices with, which they operate.

2.1 The Code of GMP for the Australian grape and wine industry

The wine industry is a sector of the food industry and wineries can be considered as food processing premises. Each industry may have its own special needs and considerations in respect to food safety, but there are some universally applicable principles that apply to winemaking as they might apply to other foods. As in other food industries, it is useful for the Australian grape and wine industry to express the relevant principles in a Code of GMP.

The following GMP recommendations should be followed by grapegrowers and winemakers in the production of wine. It is noted that not all the features listed are a necessary part of a HACCP-based food safety program. The adoption of this Code should improve the safety and hygiene aspects of production, reduce the risks and minimise the number and extent of exposures to hazards, thereby increasing the overall safety of the product for human consumption.

The inherent safety of wine means that the measures described in the Code are not as stringent as those found for most other foods, but

while wine may be considered as having a lower risk for hazards compared with other foodstuffs, this does not mean that GMP should not be followed.

IMPORTANT NOTE *Wine is considered as food and should be produced under conditions that ensure that the product is safe for consumption.*

2.2 GMP documentation and records

The company should document their own procedures in areas relating to the GMP. Such documentation can take any form and might commonly comprise a manual and any relevant instructions. This can be formatted to correspond with the headings used in this Code of GMP.

Wineries with comprehensive QA systems will probably already be complying with many of the elements presented here.

3 GMP recommendations

The following Code of GMP is structured as a checklist so that individual companies can add, modify or delete requirements as required.

3.1 General

All acts, regulations, orders or notices relevant to the Australian wine industry should be complied with at all times with respect to both production methods and presentation of the final product. Some of the relevant acts and regulations include the following:

- ▶ Australian Food Standards Code;
- ▶ State (Model) *Food Act 1980*;
- ▶ *Australian Wine and Brandy Corporation Act 1980* and *Regulations*;
- ▶ Australian Wine and Brandy Corporation's Label Integrity Program;
- ▶ *Trade Practices Act 1974*;
- ▶ *Trade Measurements Act 1993*;
- ▶ State *Wine Grapes Industry Act 1991*;

- ▶ *Phylloxera and Grape Industry Act 1995 (SA)*;
 - ▶ *Environmental Protection and Authority Act 1993*;
 - ▶ State environmental protection acts;
 - ▶ State occupational health, welfare and safety acts;
 - ▶ State liquor licensing acts; and
 - ▶ Local council by-laws and development regulations.
1. All wine for export should be made in compliance with the legal requirements of Australia and/or the country of destination.
 2. All manufacturing procedures should ensure that the safety of employees and consumers is never compromised.
 3. Wine for commercial trade should only be made by licensed winemakers in premises that meet the conditions of the license.
 4. The company should conduct regular checks for compliance with the conditions of GMP.
 5. Responsible policies and procedures for minimising the impact on the environment and production of waste should be developed.
 6. Any waste materials generated by production should be managed so as to ensure minimal impact on the environment. Recycling of materials should be practiced where possible.

3.1.1 Management

1. Internationally recognised management standards, including ISO 9000 (quality) and ISO 14000 (environmental), should be used to assist in the achievement of continuous improvement and best management practices.
2. Quality management practices should be implemented with consideration of the customers' requirements and they should be appropriate to the scale/size of operation.
3. When subcontracting any operations, the subcontractor should be required to follow GMP as a minimum and, preferably, will have an active HACCP program in place.

4. There should be a clearly identified management and responsibility structure for making critical decisions. Responsibilities and authorities of all personnel should be clearly defined.
5. Management should have copies of all current relevant legislation regarding the making and sale of wine in Australia, and other countries where exports are being considered or made.
6. Personnel responsible for directing grapegrowing and/or winemaking should have the necessary training and/or experience to assure the safety and purity of the finished product.
7. Any changes in procedure should be authorised by a pre-designated management representative (e.g. senior winemaker).
8. A procedure for approving changes to raw materials, processing conditions and final product specification should be documented and followed at all times. Any specific customer requirements with regard to additive usage should be adhered to.
9. Where the company does not employ trained laboratory technical personnel, critical tests should be performed by an appropriate outside agency or consultant.
10. All wine, at any stage of production through to shipment, should be clearly identifiable and traceable to records.

3.1.2 Employee practices

1. Employees should have good personal hygiene – training should be provided where necessary.
2. All personnel should have the necessary training and experience to perform their assigned functions in manufacture and control.
3. Employees should wear clean sound clothing while working with wine. Suitable closed footwear should be worn in the production areas of the winery. Employees should not wear loose fitting clothing or jewellery or accessories while working in the bottling areas of the winery.

- Smoking should not be permitted within the wine processing areas and should be discouraged in the workplace – appropriate signs may be installed. Personnel should eat and smoke only in designated areas.
- Wash basins supplied with suitable soap/sanitiser, hot water at 55°C and drying facilities should be provided near work areas and in all toilet areas. Employees should use these to maintain personal cleanliness.
- Employees should be encouraged to report to management all cases of GMP not being followed, and any examples of hazardous conditions (in terms of both product and employee safety).
- All designated occupational health and safety procedures should be followed. The behaviour of personnel should not endanger the health or safety of other employees.
- All personnel are responsible for the cleanliness of their own work area.
- Personnel should be free from any communicable disease or open skin lesions on the exposed skin of the body if the condition is a risk to the safety of the product.
- Medical dressings should be secure on any employee while they are working with harvested grapes, wine or empty packaging materials.

3.1.3 Records

- All records covering raw materials and processing conditions should be kept for at least a minimum of three years or longer if required by applicable laws. They should be legible, accurate and easily understood. Records should clearly identify the item to which they relate.
- A system for reviewing and disposing of old records to ensure that the record system maintains efficiency should be implemented.
- All records should have a means of identification so that dates, batches and codes can be traced.
- Records detailing distribution of a product should be maintained so that in the event of a product recall it is possible to trace the product.

- Comprehensive records detailing the disposition of any reworked, recalled or withdrawn products should be kept for three years or as required by applicable laws.

3.1.4 Finished product

- Labelling of each container (e.g. bottle) by batch and date coding should be practised in addition to batch and date code labelling of bins or cartons and pallets.
- All finished batches should be inspected and tested as appropriate prior to release. Inspection tests should include a sensory evaluation, and determination of the concentration of sulfur dioxide, alcohol, titratable acidity, pH value and volatile acidity. It is also desirable to check for heat (protein) and cold (tartrate) stability.
- Adequate samples of labelled, finished product should be kept for any possible future reference. Such samples should be clearly labelled and securely stored in a cool and dry location.
- Batch codes should be changed frequently (not less than daily) to facilitate trace-back or recall. Where the batch code involves the date, this should be carefully checked for accuracy before use.
- All glass packed product for distribution should be securely packed in strong closed cartons or boxes suitable for the protection of the wine during distribution. Cartons or boxes should be clearly identified.
- Product closures (e.g. corks, cask valves and screw caps) should be of sufficient quality to ensure that leakage does not occur during normal storage and handling.

3.2 Environment and facilities

3.2.1 General

1. The buildings and grounds should be maintained in an orderly, hygienic, and neat and tidy condition.
2. The buildings and grounds should be constructed of suitable materials for the intended usage. The buildings should be kept in a good state of repair so that airborne debris and water cannot enter, and should be constructed of materials that meet legal requirements, and can be easily kept clean.
3. All types of waste (e.g. general refuse, winemaking waste and sewage) should be appropriately disposed of according to local requirements and in compliance with current legislation.

3.2.2 External

1. The grounds should be kept clean and free from rubbish at all times.
2. The external rubbish depot should be kept tidy and orderly. All refuse containers should be kept well covered to prevent access by rodents, birds and other pests, and rubbish removed regularly from the site.
3. Where wineries have outside processing areas, tank farms and outdoor fermenters, particular steps should be taken to ensure that such areas are kept free of rubbish, are free draining (surrounding land should not drain onto the winemaking area) and are laid out to allow easy access and cleaning. Fermenters and tanks should be kept as closely closed as practical at all times other than when being worked. Special attention should be paid to ensure the security of such fermenters, tanks and vats.
4. There should be no external cracks or gaps in walls and around doors or windows that might allow access for rodents or other pests. All breaches should be reported and repaired promptly.
5. A positive pest control program should be undertaken to keep vermin and other animals from entering buildings and processing areas.

3.2.3 Internal

1. Floors in the winery and storage areas should be free draining and free from debris build-up, and should be kept in a sound condition. They should be constructed of materials that can be readily cleaned and designed to facilitate easy cleaning.
2. All storage and dispatch areas should be regularly inspected for possible cross contamination or damage to raw materials/finished product.
3. The winery, and particularly storage areas, should be ventilated to prevent condensation, excessive heat and humidity build up, and be free of debris build up. All stored material should be clearly identified.
4. The plumbing should be kept in a sound state and all fittings should be of an approved sanitary type.
5. The lighting should at all times be adequate, especially in the processing areas, to ensure safe operation of the equipment and to assist with cleaning. Light fittings should be enclosed wherever possible.
6. All equipment should be installed so that easy access is possible for operating, servicing and cleaning. All access ways and passages should be kept clear of rubbish, empty packaging, raw materials and finished product at all times. Equipment, including hoses, not in use should be stored in a clean condition in their designated area.
7. Any rubbish container within the winery should be secure from rodents and other pests, and should be regularly emptied.
8. Pest control baits should be clearly marked and placed so as to prevent contamination or accidental spillage. A pest control program should be implemented and monitored for its efficacy.
9. All staff eating and changing areas should be maintained, well lit and ventilated, and cleaned regularly. These areas should be isolated from any production and storage area.
10. All toilets should be well ventilated, kept clean, and suitably supplied with hand washing (soap/sanitiser and hot water at 55°C) and drying facilities.

11. The bottling area should be specifically designed to prevent ingress of foreign matter and pests. It should be well lit and ventilated to allow proper venting of fumes and steam from bottling washing equipment.
12. All light fittings in the bottling area should be sealed so that insects cannot be trapped inside them and glass cannot fall into the processing area at times of breakage.
13. There should be adequate equipment washing facilities readily available.
14. There should be sufficient storage for all raw materials and finished product so that each item can be clearly identified and kept separate from cleaning chemicals and other materials and not suffer deterioration. Incompatible materials should not be stored together.
15. The packaging area should be kept free of non-essential equipment and materials not used in packaging operations. Scrap packaging and any other waste should be cleared from the area at least daily.
16. A proper protocol covering maintenance operations should be established to ensure that food grade materials are used, that hazardous waste is removed and that equipment is left in a clean state fit for use.
17. Food containers (including wine bottles and flagons) should not be used for the storage of non-food materials, such as lubricating oils and cleaning agents.

3.2.4 Equipment

1. All equipment should be suitable for its intended purpose.
2. Equipment should be of hygienic construction. Contact surfaces should be of food grade materials suitable for use in wineries, and should be resistant to corrosion and inert so as not to impart any taint to wine.
3. All equipment should be designed for easy cleaning by being free from cracks and crevices, which are difficult to clean. Welds should be smooth, corners rounded, and all wine-contact surfaces easily accessible and readily cleaned.

4. Proper cleaning and sanitising procedures should be established, documented and followed to ensure that equipment is clean, and contamination of product with cleaning and sanitiser residues is prevented.
5. All equipment, which comes into contact with grapes, must, juice or wine should be cleaned and sanitised where appropriate, prior to and promptly after use.
6. Equipment should be installed in such a way as to minimise the possibility of contamination and cross-contamination.
7. All lubricants used in places where seepage or leakage to grapes or wine is possible should be approved for use in food processing situations by the US Food and Drug Administration (FDA) (www.fda.gov) and Bureau of Alcohol Tobacco and Firearms (BATF) (www.atf.treas.gov/), Codex Alimentarius (<http://www.fao.org/waicent/faoinfo/economic/esn/CODEX/Default.htm>) or other appropriate authority. Care should be used in the lubrication of equipment to avoid contamination of product with lubricants.
8. Where a secondary refrigerant is used for cooling fermentations, checks should be made to ensure prompt detection of leaks should they occur.
9. Wherever practicable, glass equipment, including thermometers, are not to be used in the winery. If items of glassware are broken or dropped into wine, steps should be taken immediately to remove the glass.
10. Mercury-in-glass thermometers are not to be used in the winery. Digital or mechanical dial thermometers are preferable.
11. Fixed pipelines should be clearly labelled or identified to prevent confusion. They should be completely free draining so as to prevent any retention of residual pockets of liquids.
12. Filling and corking equipment should be designed to prevent damage to bottles particularly in the neck and bore mouth region.
13. Pre-processing checks of equipment and facility cleanliness should be made.

3.3 Production

3.3.1 Raw materials

1. All additives and processing aids that are used should be approved for use in the production of wine, sparkling wine, fortified wine or wine products, according to the Australian Food Standards Code or other relevant acts and regulations.
2. Only food grade additives and ingredients should be purchased and used in winemaking.
3. A system should be implemented covering the purchase and inspection prior to use of all additives, processing aids and other materials used in winemaking. All incoming goods should be inspected for seal integrity and product identity on arrival. Where seal integrity has been lost, an authorised person should immediately inspect the material for acceptability. Quantities should be noted and, preferably, packages dated with the receival date and, in the case of unstable or restricted shelf life products, the use-by-date should be marked on the outer package. Short shelf-life products should be used in rotation.
4. Materials from new sources of supply should be given special attention on receipt to determine the correctness of identity and safety of packaging.
5. Where possible, samples from deliveries of raw materials should be analysed for purity and conformance to the material specifications. A batch certificate of analysis provided by the supplier on delivery may be sufficient to verify the purity.
6. Any sub-standard or incorrect raw material should be clearly identified and physically separated from approved items. Such material should be returned to the supplier, destroyed or otherwise disposed of without undue delay. Records of the disposition of such material should be maintained.
7. All hazardous and toxic materials (e.g. sulfur dioxide in its various forms and copper sulfate) should be clearly marked as such. Storage

- containers should be clearly and correctly labelled. Only designated authorised persons should dispense such materials from the store area. Records of their use should be kept. Procedures should be devised to ensure that usage rates are easily and correctly calculated.
8. All raw materials and cleaning materials should be clearly labelled and identified. Cleaning materials should be stored in containers that are distinctly different to containers used for additives. Both lids and bodies of storage containers should be labelled. Colour coding should be used where appropriate.
 9. Only cleaners and sanitising agents approved by the US Food and Drug Administration (FDA) and Bureau of Alcohol Tobacco and Firearms (BATF), or another appropriate authority, for use in food processing should be used.
 10. All wine additives, processing aids and other materials used in winemaking should be stored away from all hazardous and non-food substances, such as cleaning agents, to prevent cross contamination.
 11. Storage areas should be maintained in a clean and tidy state.
 12. Pallets of raw materials should be stored in a manner to facilitate cleaning of the storage areas.
 13. There should be an adequate supply of potable water that meets all legal requirements.

3.3.2 Equipment

1. Processing waste, such as grape skins and lees, should be removed from equipment as soon as practicable.
2. The stipulated (and preferably documented) cleaning procedures should be strictly adhered to at all times, and the equipment checked after cleaning and before reuse.

3.3.3 Grapegrowing

1. Grapegrowing should be conducted to ensure maximum productivity and quality is achieved through effective control of pests and diseases with a minimum impact on the environment, neighbours, operators or consumers.
2. Grapegrowers should manage their vineyards in accordance with a documented plan developed through a property management planning course or equivalent.
3. Grapegrowers should ensure that all agrochemicals used are registered for use in Australian winegrape production. This information can be sourced from *Agrochemicals registered for use in Australian viticulture 1999/2000* (Sas and Daniel 1999) or the Institute's web site at www.adelaide.edu.au/AWRI/agrochem/agrochem.htm.
4. In some cases, the use of agrochemicals may need to be restricted to ensure that the maximum residue limit (MRL) is met. These restrictions are normally stipulated by the winery (i.e. the customer).
5. Fertiliser, sprays and irrigation water should be used and applied for maximum efficiency through response to active monitoring.
6. Accurate records of all vineyard operations should be maintained. All grapegrowers should keep an accurate, up-to-date spray diary in accordance with any requirements of the winery that they supply.
7. A positive program to avoid spray drift should be instituted. This should cover the drift of spray being applied to the grapes as well as the avoidance of drift of sprays applied to adjacent crops. All cases of spray drift should be investigated, recorded and reported. In all cases, appropriate action should be taken to ensure that the grapes and the wine made from them are not in contravention of legal requirements.
8. Personnel that are responsible for the receipt, storage, handling, and use of agrochemicals should have completed appropriate relevant training (e.g. Farmcare Australia course).

9. All chemicals used in the vineyard should be stored in accordance with the Australian Standard *AS 2507-1998 The storage and handling of agricultural and veterinary chemicals*.
10. Spraying equipment should be calibrated at least once per season using the appropriate method of calibration.

3.3.4 Grape harvesting

1. Containers used for holding and transporting harvested grapes should be clean and made of a suitable material so that they do not contaminate the grapes with chemicals, dirt or any other foreign materials. Where liners are used in the containers, they should be impervious and should not be capable of contaminating the grapes.
2. Where mechanical harvesting is used, the harvester should be operated and maintained in such a way as to prevent oil or lubricants from contaminating the grapes. Prior to start up, the condition of all beaters and conveyors should be checked for freedom from foreign matter and built up dirt.
3. Grapes should be checked for signs of abnormal and unacceptable contamination prior to crushing.

3.3.5 Winemaking

1. After cleaning, all equipment should be rinsed with clean potable water. If the equipment is not to be used immediately it should be allowed to drain dry.
2. Processing records should be kept so that all batches of product can be identified and amounts of raw materials used identified. These records should satisfy the requirements of the Australian Wine and Brandy Corporation's Label Integrity Program. A system for checking quantities added of additives that are limited by legal requirements should be employed.
3. Samples of wine should be inspected and tested as appropriate both before and after any processing operation.
4. All hoses should be stored in a manner that allows self draining. They should be flushed with potable water before use to ensure freedom from foreign matter.
5. Any instance of contamination should be reported to a designated responsible person (e.g. the winemaker) immediately the contamination occurs or is detected. The contamination should be recorded.
6. Any wine spillage should be cleaned up immediately using procedures appropriate to the location of the spillage.
7. Any water used in the production of wine, preparation of wine additives, and the washing through of lines, equipment and packaging materials, should be of potable standard and meet all legal requirements. Where water is sourced from an 'uncontrolled' source (i.e. other than a municipal supply), it should be checked for potability at least once a year unless experience or other factors indicate more frequent testing is required.
8. Where preservatives such as sulfur dioxide, sorbic acid and sorbates are added prior to bottling, the concentration should be determined and verified to ensure legal conformance. The method of disposal of wine that does not conform should be determined by an approved person.



3.3.6 Laboratory

1. An approved designated person (e.g. the laboratory manager) should be responsible for the accuracy of the information provided to production management.
2. The laboratory should maintain a manual (electronic or otherwise), which lists the current approved test procedures.
3. Where no suitably equipped laboratory exists on-site, testing should be carried out at the required time by a competent approved external body.
4. All test methods and equipment should be monitored regularly by defined checking procedures (e.g. duplicates and reference standards) to ensure their accuracy and reliability.
5. An appropriately trained person(s) should be given responsibility for testing of grapes, juice, must, wine and raw materials.
6. Laboratory test records should be kept in a permanent form (electronic or otherwise). Product test records may include sulfur dioxide, alcohol, pH value, titratable acidity and the appropriate product code.
7. Library samples of all batches or bottling runs of product should be kept for an appropriate period of time (up to five years) for future reference.
8. Scientific laboratory glassware should not be taken into the public tasting area. It is desirable that laboratory tasting glassware is kept separate from the public tasting glasses.

3.3.7 Packaging operations

1. Bottles used for packaging wine should preferably be new. Where recycled bottles are used, they should undergo a company-approved washing process before being filled.
2. Equipment, such as bottle washers, fillers, rinsers and corkers, should be checked for correct settings and feed wheels adjusted to ensure that no damage to bottles occurs. Particular attention should be paid to the operation of the filling and corking equipment to ensure that foreign matter, in particular, glass fragments and cork dust, are not generated by faulty adjustment and operation.
3. Wine should be filtered immediately prior to filling using media of suitable grade so as to ensure that refermentation does not occur in the bottle.
4. Filter integrity should be checked, especially in the case of wines containing residual sugar, since microbiological contamination may lead to refermentation that could cause an unsafe concentration of carbon dioxide to build up in the bottle.
5. All wine should pass through at least a fine mesh screen in the filler supply line to reduce the risk of insoluble foreign matter passing into the final package.
6. Headspace in cork finished bottled wine should be sufficient to meet legal requirements and also be adequate so that wine expansion due to temperature fluctuations will not cause movement of the corks.



3.3.7.1 Bottling hall procedures

3.3.7.1.1 Broken glass handling

1. A protocol should be implemented for handling of glass waste. Glass waste should be clearly identified and kept separate when recycling is practised.
2. Before use, all pallets and cartons of glass bottles should be checked for signs of damage and broken glass. Any containers or pallets with broken glass should be segregated and thoroughly inspected. Where broken bottles or contamination of a pallet with broken glass is detected, special care should be taken when removing layer dividers to prevent contamination of lower layers of bottles.
3. When any glass bottles are broken in the packaging area a thorough and comprehensive clean up of the area should be undertaken immediately. Initially, cleaning should be accomplished by careful brushing or, if available, a high capacity vacuum cleaner. Only then is washing with water to be undertaken. Methods such as air blast and high pressure water blasting should be avoided, as they tend to cause the widespread broadcasting of fine glass shards and dust. Bottling will recommence only when the supervisor is satisfied that all broken glass has been removed.
4. Where breakage has occurred on the filling line, particular attention should be paid to adjacent bottles to ensure freedom from contamination. Where breakage has occurred on the filling machine, particular attention should be paid to the bottles filled from adjacent filler heads to ensure that fill height adjustment and cleanliness are satisfactory.
5. Particular attention should be paid to any bottle breakages when filling sparkling wine because of the wider distribution of shards of glass and remains of the shattered bottles. Any nearby open bottles should be carefully checked.

3.3.7.1.2 Bottling

1. Where possible, glass (bottle) storage should be under cover.
2. The condition of all glass bottles should be checked prior to use. The integrity of protective packaging and the condition of the bottles should be satisfactory. No visible matter should be tolerated in any bottles.
3. Because dimensional differences can cause bottling equipment malfunction and bottle chipping, all bottles used for one bottling run should be of the same type. When changing bottle type, the equipment settings should be checked before re-start.
4. Any open bottles should be shielded between items of bottling equipment by the use of covers over the conveyors.
5. Where cold rinsing solutions are used they should be made with potable water and with an appropriate biocide (e.g. sulfur dioxide at approximately 0.25%, i.e. 2500 mg/L). For personnel safety, forced air removal from the rinser is recommended.
6. Where bottles are air blast dried following rinsing, the air should be dry, oil free and filtered.
7. Bottles should be filled using equipment and procedures that minimise the ingress of air in order to prevent oxidation.
8. Where hand filling is used, rinsed bottles should be protected so that foreign matter cannot enter the bottle.
9. The filling procedure should be organised to minimise delays between cleaning/rinsing/drying operations and filling and sealing to minimise the risk of any possible contamination between operations.
10. Bottles should be sealed as soon as possible after filling and not left standing open. At planned staff breaks, no prepared bottles should be left unfilled or unsealed.



11. At start-up, the supervisor should check that the filling heads and corking equipment are correctly adjusted to avoid chipping bottle necks. The condition of the necks of bottles filled from each filling head should be inspected for damage and checked regularly during the production run.
12. The closure (e.g. cork, synthetic closure and screw cap) hoppers should be fitted with covers that should be used at all times.
13. Particular care should be taken when opening bags of closures to ensure that no foreign matter or bag material is dropped into the hopper.
14. For 'sterile' bottling of wines containing residual sugar, only new unopened bags of sterilised closures should be used. Partly used containers of closures should be kept securely closed and should only be subsequently used for 'non-sterile' sealing of dry wines.
15. Any disgorged and recovered wine should be filtered before repackaging. Particular attention should be paid to avoid any glass contamination.
16. Records of all packaging runs should be maintained detailing product type, code, quantity and other relevant information. All packaging records should be reviewed within 24 hours for completeness and acceptability.
17. All finished packaged wine should be removed promptly from the packaging area.

3.3.7.1.3 Bag-in-box

1. Only new, approved food grade bags should be used. The supplier should be required to certify that all bags are of food grade standard.
2. All wine bags should be evacuated before filling.
3. Overfill spillage should be promptly cleaned.

3.3.8 Rework, quarantine and product recall

1. A quarantine system for identifying and separating unsatisfactory product should be developed and followed at all times.
2. Adequate space should be provided for separate storage of quarantined products.
3. All product that does not meet final product specification should be labelled and stored in quarantine until its disposition has been determined. Any rejected material should be clearly marked as such.
4. Product should be reworked only with prior approval from the appropriate authorised person and using the relevant methods. Reworking should be viewed as an abnormal procedure requiring special care.
5. The reworking (or possibly blending) of any recalled wine should be strictly controlled and documented. The senior winemaker or other approved person should determine the details of such reworking.
6. An effective product recall program should be developed, documented and followed when required. This should conform to the protocol recommended by the Australia New Zealand Food Authority (ANZFA 1997).
7. Any recalled/withdrawn product should be clearly identified and stored away from other finished product. Disposition (e.g. rework or disposal) of recalled product should be determined by the relevant authorised person as outlined in the food recall program.

3.4 Storage and distribution

1. All storage areas should be maintained in a clean, dry condition and all goods should be clearly identifiable as to identity and current status.
2. Finished product should be released only after it has been cleared for distribution.
3. All customer complaints about the finished product should be recorded and investigated.
4. The status of damaged goods in storage areas should be clearly marked.
5. Storage areas should be of an adequate size to store the necessary raw materials and the final product without abnormal deterioration or contamination.

4 References

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