



ALCOHOLIC &NON ALCOHOLIC BEVERAGE PROCESSING -Level-II

**Based on October 2019, Version 2
Occupational standards**

**Module Title: - Operating a Bottle
washing Machine**

**LG Code: ND ANB2 LO (1-4) LG
(48-51)**

**TTLM Code: IND ANB2 TTLM M11
0920**

October 2020



Table of Contents

LO #1- Prepare the equipment and process for operation4

Instruction sheet.....	4
Information Sheet 1- Confirming equipment and materials	6
Self-check 1	14
Information Sheet 2- Identifying and confirming cleaning and maintenance	15
Self-check 2.....	22
Information Sheet 3- Fitting and adjusting machine components.....	23
Self-Check – 3	25
Information Sheet 4 - Checking and adjusting equipment performance	26
Self-Check – 4	27
Information Sheet 5- Carrying out pre-start checks.....	29
Self-Check – 5	34
Information Sheet 6- Confirming services	34
Self-check 6.....	36

LO#2-Operate and monitor the bottle, plastic and keg washing process37

Instruction sheet.....	37
Information Sheet 1- Starting and operating the process	40
Self-check 1	45
Information Sheet 2- Inspecting and washing empty bottles, plastic jars and keg.....	48
Self-check 2.....	54
Information Sheet 3 - Transferring washed bottles , plastic jars and keg to inspection	55
Self-Check – 3	62
Information Sheet 4- Identifying variation in equipment operation.....	63
Self-check 4.....	66
Information Sheet 5- Identifying, rectifying and reporting out-of-specification	67
Self-check 5	70
Information Sheet 6- Maintaining the work area.....	71
Self-check 6.....	73
Information Sheet 7- Conducting work within environmental guidelines	74
Self-check 7.....	76
Information Sheet 8- Maintaining workplace records	77
Self-check 8.....	80

LO #3- Shut down the bottle and keg washing process81



Instruction sheet.....81

Information Sheet 1- Identifying shutdown procedure83

 Self-check 184

Information Sheet 2- Shutting down the process.....85

 Self-check 286

Information Sheet 3- Identifying and reporting maintenance requirements87

 Self-check 3.....90

LO #4-Record information.....91

Instruction sheet :91

Information Sheet 1- Recording workplace information.....93

 Self-Check – 194

Information Sheet 2- Signing all records96

 Self-Check – 298

Information Sheet 3- Communicating information records99

 Self-Check – 3100

Information Sheet 4- Keeping workplace information records101

 Self-Check – 4 **Error! Bookmark not defined.**

Page 3 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



LG #43

LO #1- Prepare the equipment and process for operation

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Confirming equipment and materials
- Identifying and confirming cleaning and maintenance
- Fitting and adjusting machine components
- Checking and adjusting equipment performance
- Carrying out pre-start checks
- Confirming services

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Confirm equipment and materials
- Identify and confirm cleaning and maintenance
- Fit and adjust machine components
- Check and adjust equipment performance
- Carry out pre-start checks
- Confirm services

Learning Instructions:

1. Read the specific objectives of this Learning Guide.



2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Page 5 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 1- Confirming equipment and materials

Common sanitizing agents for wineries

- Caustic soda
- Quats/QAC
- Peracetic acid compounds
- Hydrogen peroxide – powerful oxidizer. Somewhat unstable.

Common winery cleaning sanitation application

- Cleaning of winery premises
- Pumps and hoses /fermentation and wine storage containers (tank)
- Harvest equipment
 - ✓ De-stemmer/crusher, inclines and sorting tables
 - ✓ Press
- Filters
- Fillers
- Barrels
- Utensils, fittings and other equipment

Page 6 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

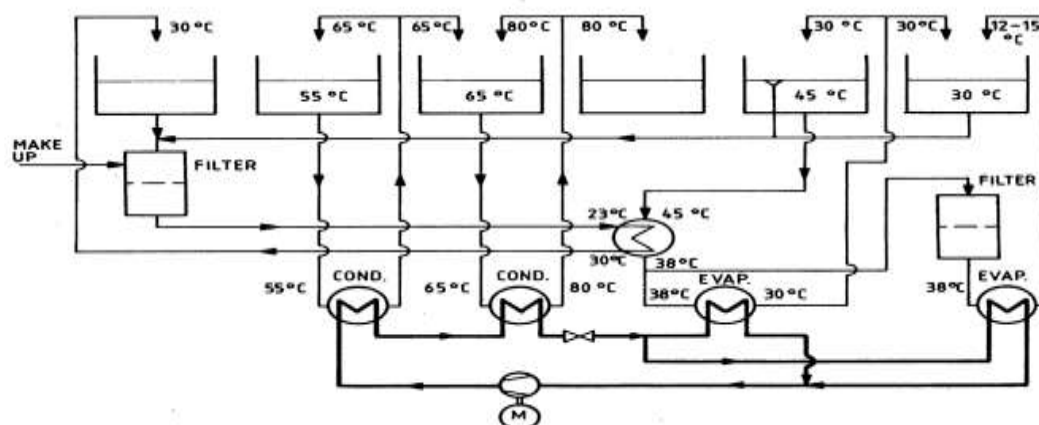


Figure 1. Bottle washing flow diagram

Equipment for bottle washing

1. Bottle washer
2. Bottle warmer
3. Bottle dryer
4. Drying tunnels

Bottle washing machine

To achieve a complete cleaning effect in the bottle washing machines, the following steps operating steps are performed

- draining of remaining beer/wine
- pre-soaking,
- caustic bath,
- Caustic spray.
- intermediate spray,
- warm water spray
- cold water spray
- Fresh water spray.

Design bottle washing machine

There are several ways to perform these operating

Steps. Basically two different bottle washing machines arc used:

Page 7 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- single end machine
- Double end machine

Corresponding to the size of total filling line of bottle washing machines are designed for throughputs of below 10,000 to 100,000 below/hour.

Single end washing machines

In the case of normal single end machines the bottle loading and discharge section are found at the same end of the machine. A single end washing machine

After loading the bottles are first drained of any residual beer/wine. Since returned bottles very frequently still contain acidic residues of beverage or a liquid which the consumer has in the meantime been storing in them, it is good if the residual draining of the bottles takes place before treatment of the interior of the bottle. The drained drink residues are biologically heavily

contaminated and, where possible, should undergo a special anaerobic treatment. Following this the bottles pass through two consecutive immersion baths (1+2) dirt is pre-dissolved. Furthermore they are pre-heated inside and out to about 40°C and following a rotation, rinsed with water at about 40 to 50°C (3).

In the following pre-caustic bath (4) a further heating to about 60°C occurs as well as a further partial dissolution of the dirt particles. For the pre-washing only over flow from the warm jets of the washed bottles are used. The water in the immersion bath increasingly cools down –particularly in the cold season. In this way as well as pre-soaking, pre-heating of the bottles also occurs, and by gentle increasing of temperature stress in glass bottles is prevented.

The longest and most intensive treatment of the bottles both inside and outside now occurs in the form a multiply passage through a caustic bath (5) for returnable glass bottles for 6 to 8 (to 10) min at 80°C. During this time all dirt and every form of impurity has to be dissolved. This also applies to the labels and label glue.

If the washing machine is has two caustic baths (6), the second caustic is often held at somewhat lower temperature (65 to 75°C) and also at a lower caustic concentration (0.6 to 0.8% NaOH), because hot caustic is already being continually dragged in.

Page 8 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

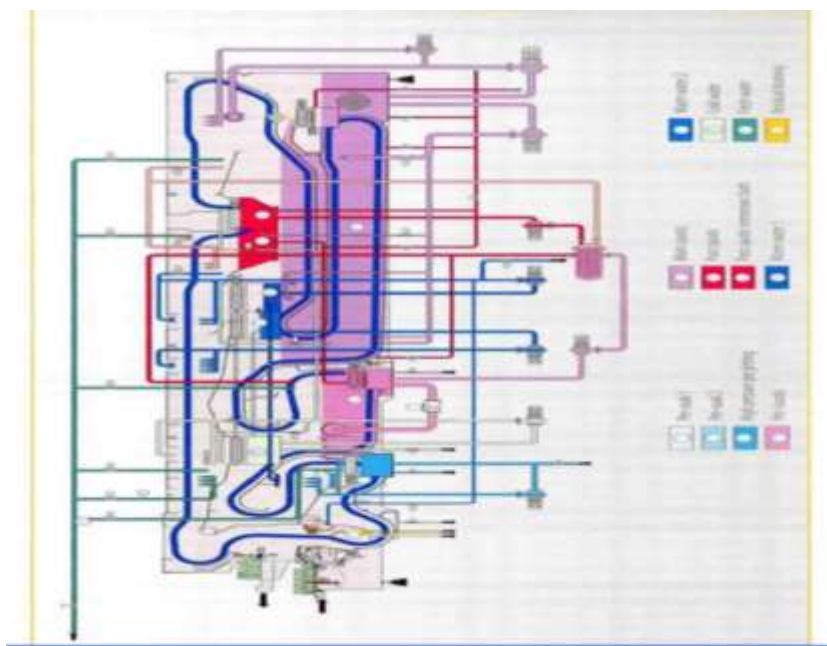


Figure 2 . Construction of single end bottle washing machine

Since the cleaning caustic is cooled down by the newly incoming bottles it is circulated using a powerful circulating pump (displacement 100 to 150 m³/h), and permanently maintained at the desired temperature by means of a flow heater.

The labels are expected to completely dissolve and not to shred because they will otherwise increase the amount of sludge and make washing more difficult. The labels are removed using suitable equipment

Sludge forms in the bottom of the machine. Which has to be isolated (see section:

Treatment of cleaning Caustic). Because it increasingly hinders the effectiveness of the caustic. The bottles which are filled with caustic are then diverted, cleaned and any remaining labels washed off. The bottles run back empty and the caustic to the caustic bath.

In second caustic bath immersion (6) bottles are once again washed from the outside at 50 to 55°C and thereby cooled then down somewhat. The run off and the surplus heat from the caustic spraying are fed back to the pre-caustic bath (5).

In the following stations (8+9) the bottles are rinsed out with water which decreases in temperature (10) - firstly both inside and outside – in order to remove the remains of the caustic and the caustic additives and to cool the bottles down step by step and then, finally using fresh water of 10 to 12°C (11). It can be assumed that only a drop residue of about 1ml/bottle or less remains. Whilst the bottles are running

Page 9 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



through, the used cleaning water is fed back to the pre-soaking tanks and thus works to counteract any concentration and carrying over of the cleaning agent.

It can be assumed that no micro-organisms will survive the long and hot caustic bath. The bottles being

Discharged from the bottle discharge zone can only be classified as bacteria free if no microorganisms pass back in to the inside of the bottle through the injection water . however, the long-term studies have shown that reusing water which has been conveyed from or or held in breweries /wineries'own wells can lead to the presence of microorganisms, including bacteria as well as yeast and mould spores, in the rinsing water. These can be removed (assuming) tha tunnel pasteurization doesnot occur). This can cause biological problems in the finished product

Of particular danger here are also the basins and pipes of the hot water spraying sections which at temperature of 30 to 50°C , provide the bacteria with optimal growth conditions and which therefore have to regularly cleaned.

This applies above all to the entire space next to and above the spray jets which at these temperatures provide the basis for the formation of microbe nests. If micro-organisms find their way into the bottle in this phase (contamination), they can no longer to completely remove by the subsequent fresh water spraying. Porous mineral scale deposits are also often found in the plants, which serve as breeding grounds for contaminants.

Biologically flawless rinsing water (warm and cold) is of particular importance. As a result, permissible amount of chlorine dioxide (ClO₂) is frequently added to the final rinsing water so as not to take any risks. The permanently damp and warm headroom above the bottle washing machine must likewise be viewed as a reservoir for germs.

The amount of water remaining inside the bottle falls within half minute to below 0.5 ml 0.5-1- bottle.

This time is, however, is not available. The bottles are then passed on to the inspection plant.

Advantages of single end machine

- Good use of space as well as low surface area and machine height.
- economical operation, particularly in the case of small plants and
- a lower price.

The disadvantage is

Page 10 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Uncleansed bottles are fed in near to the cleaned bottles which can lead biological problems if nothing is done about this

Double end bottle washing machine

A different types of construction bottle washing machine plants are double end machines. Where bottle loading and removal occur at opposite ends of the machine. In most cases an equally intensive treatment of the bottle is obtained by means of large caustic baths with vertically arranged immersion loops. Machines are built with up to six caustic immersion loops; the caustic immersion time in the case of this is machine also 6 to 8 min and if necessary considerably longer (up to 25 min). Following loading the bottles are conveyed upward and their residue are emptied (1). This residue emptying is very important because in the returning bottles there can frequently be found

- spoiled drink residues, often in large quantities, but also
- residues of other liquid which was kept in the bottle

If these enter the first steeping water, it means unnecessary pollution. The residues present a heavy waste water load and are fed directly to the waste water treatment. In the case of double end machine illustrated in the figure below, residual emptying occurs first with separate draining (1), then comes pre-rinsing (3) with warm water followed by pre-soaking in the caustic immersion bath (4) and a further warming of the bottles of the bottles to 50 to 60°C. In the foil wing two (5+6) or three caustic immersion bath the bottles are soaked intensively at different temper, lures and then rinsed out.

The bottles are soaked intensively at different temperatures and then rinsed out. The long and intensive caustic treatment guarantees thorough cleaning, which is supported by constant movement of the cleaning caustic and removal of labels.

The first caustic bath (5) has the above mentioned temperature of 80 to 85°C the second caustic bath (6) sometimes has a lower temperature of 65 to 70°C. The inevitably high construction of this double end machine necessitate a reverse loop at the end of the machine, which is the first used for a warm water immersion bath (10) before here too, all remains of caustic and additives are removed in further jetting zones are (11) by water at decreasing temperature and finally by fresh water, and the bottles are cooled down in stages.

Page 11 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

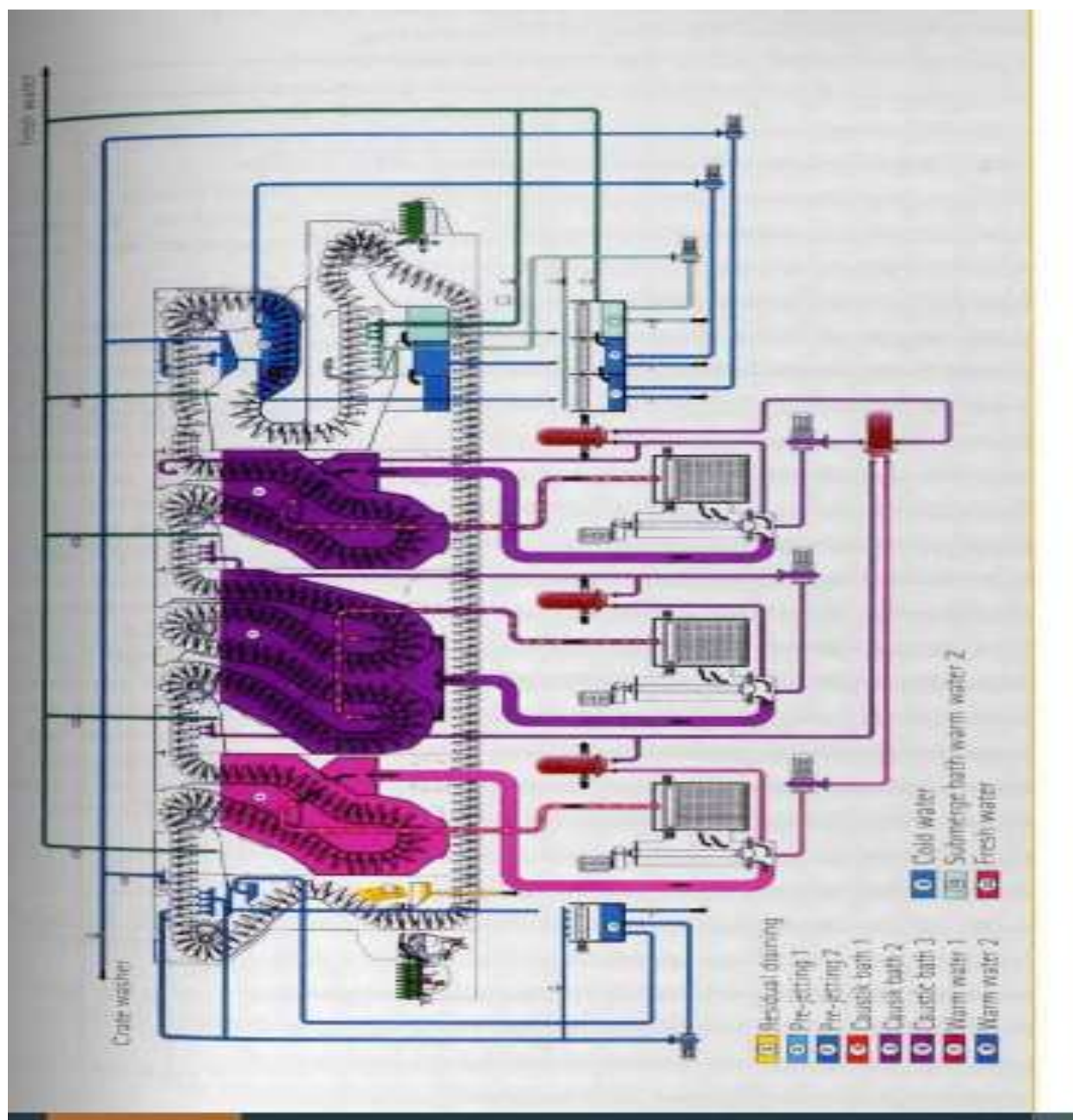


Figure 3. Double end bottle washing machine

Main components of a bottle washing machine

All bottle washing machines have a number of common components which will be described in the following. These include the heat distribution and recovery systems in the machine,

- the bottle transport through the machine
- bottle loading and discharge,

Page 12 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



- bottle spraying
- the machine drive,
- label and splinter removal
- suctioning off of vapors and hydrogen gas
- sterilization of the head parts as well as
- Operation of the machine.

Page 13 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 1	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (6 point)

Test II: Short Answer Questions

Note: Satisfactory rating - 15points Unsatisfactory - below 15 points

Page 14 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 2- Identifying and confirming cleaning and maintenance

Washing and Sanitizing

Washing is the process of removing organic and inorganic contaminants to a level of insignificance. Washing agents are designed to facilitate this process by breaking down, solubilizing and dispersing contaminants into water, so the contaminants can be washed away.

Latent microorganisms are capable of collecting nutrients and defending against attack by sanitizing agents to go on and spoil wine in the making. For this reason, it is important that the washing process be effective and adequately applied.

Winemakers often use the terms “sanitization” and “sterilization” interchangeably; however, they are not equivalent.

Sterilization is the process of eradicating all living microorganisms by using specialized technology and methodologies, such as autoclaving. Autoclaving involves exposing items to high-pressure, saturated steam at 250 °F (120 °C) for 15 to 20 minutes — certainly not a practical option for home winemaking, and it is unnecessary. Pouring boiling water on, or into, equipment is not the same as autoclaving and doing so will not sterilize, it is unlikely to be as effective as using chemical sanitizing agents, and can damage equipment. **Sanitization** is a limited form of sterilization; it is the process of eradicating living microorganisms down to an acceptable level and which has no adverse effects on winemaking.

Bear in mind that a given washing or sanitizing agent may not be compatible with every type of material in winemaking equipment. An agent that is suitable for use with stainless steel, for example, may severely damage glass, PET (polyethylene terephthalate), oak, food-grade plastics and rubbers, and other types of materials, or vice versa. Washing and sanitizing agents often do not come with sufficient and useful information to help us make informed decisions about which to use with what materials and under what conditions.

Basics of washing and sanitizing in the home winery, from pre-rinsing to the final rinse, and then review the types of agents and products available to accomplish these tasks.

Page 15 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Pre-Rinsing

Using a piece of equipment and while any organic material remains wet, rinse the equipment with a jet of cold tap water to dislodge the bulk of the material and finish with a jet of hot tap water. The hot water should not exceed 125 °F (52 °C). Water above this temperature is dangerously hot and is not necessary for effective pre-rinsing, and excessively hot water can damage many types of plastic equipment and is likely to cause soft (soda lime) glass carboys to expand unevenly and crack. Keep rinsed equipment wet until you wash it and start washing it promptly.

Preparing washing and sanitizing agents

Soaps are not up to the task of washing equipment and very likely to leave residues (soap scum). Select washing and sanitizing agents that are compatible with equipment.

- Use hot water that is not more than 125 °F (52 °C).
- Do not use higher concentrations than recommended by the manufacturers of the agents or your equipment.
- Make up your working solutions of agents in a container that is made of a material known to be especially resistant to attack by the agents. Always fill the container with water before adding the agent and when adding the concentrated agent, stir the water vigorously to ensure that the agent is quickly diluted and uniformly mixed. Adding a concentrated liquid or powdered cleaning or sanitizing agent to a container before adding water can damage the container.

Washing certain generalizations

- Don't soak your equipment for long periods in solutions of chemicals that are known to attack the materials from which the equipment is made. Short exposure may be acceptable, even recommended, but avoid prolonged (overnight or longer) soaking.
- Agitation and cautious rubbing will greatly facilitate the washing process. Use for rubbing should be sufficiently non-abrasive so that it will not scratch the surface of your equipment. Scratches will just make the equipment more difficult to wash the next time and can harbor microorganisms and other contaminants.

Page 16 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



- It is better to use your working solution of washing agent in modest, repeated doses, rather than all in one shot. The washing power of fresh working solution will be stronger and more effective than a solution that is significantly contaminated with the dissolved and suspended materials you want to wash away.

Easily accessible surfaces are generally easy to wash. Inaccessible or difficult to access surfaces are the real challenge; pumps, hoses and tubing can be especially difficult to wash. Pumps with heads that can be easily disassembled are much easier to wash. And it is much easier to tell if the inside of flexible tubing is degraded or dirty when the tubing is made of transparent or translucent material; however, be aware that not all such tubing is rated for contact with food and some types may scalp flavors, i.e. move flavors/odors between juice/wine and packaging or equipment.

There is a very effective, low-effort way to wash carboys. Combining soaking with agitation is considerably more effective than soaking alone. First add about ¾ gallon (3 liters) of hot washing solution and close the carboy with a stopper that has an easily removable vent plug.

If the washing solution gets very contaminated and is losing its effectiveness, dump it out and repeat the process. If some residues do not loosen, put a 12" (30 cm) square piece of an old bath towel in the carboy with about a ¼ gallon (1 L) of hot washing solution and repeat the slosh/roll to cause the piece of towel to rub on the residues.

Next, add about a gallon (4 L) of washing solution so that when the carboy is inverted (neck down), the line of residues near the shoulder is just submerged, bung the carboy, and invert it in a plastic pail and let the line of residues soak. Remember to release the suction until the washing solution cools to the point that suction is no longer developing.

How long you let the carboy soak, before using more agitation, will depend on the nature of your washing agent. If you are using chemicals that can damage your carboy, you will want to check the residue line every hour or two. If you are using a neutral pH **enzyme**-based detergent, you can let the carboy soak overnight, or longer.

Before moving on to sanitizing, ensure that all surfaces are thoroughly washed and rinsed. Remember: sanitizing agents are not likely to sanitize dirty surfaces effectively. And never mix a washing agent with a sanitizing agent to speed the process — it does not work and may damage equipment, and can be hazardous to your health.

Page 17 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Sanitizing

Sanitize with a suitable sanitizing agent, properly diluted and compatible with the type of equipment being washed. Chemical, as opposed to biochemical (enzyme-based), sanitizing agents typically consist of very aggressive oxidizing agents that should effectively sanitize clean surfaces in less than ten minutes. Soaking equipment in such sanitizers for long periods of time is generally unnecessary and can damage equipment. The effectiveness of enzyme mixtures as sanitizers has not been extensively tested for home winemaking, but may prove to be effective and gentler on equipment.

Final Rinse

Some non-toxic sanitizing agents (see later) do not require a water rinse; however, a final water rinse is always a good idea. Keep that part of your plumbing short and clean.

After the final rinse, drain your equipment thoroughly and ensure that it is free of odors. If an odor lingers, you might try filling the carboy, or similar equipment, with cold, odor-free water to displace all the air, then drain it and check again for odors. If they persist, cleaning should be repeated.

Washing agents

Washing products can contain several “active” ingredients, including oxidizing agents such as hydrogen peroxide, acids and bases (alkaline chemicals), surfactants that break down dirt and greasy residues, and chelating agents.

Surfactants (short for surface-active agent) are hydrophilic-hydrophobic compounds capable of:

- lifting and dispersing dirt by lowering the surface tension of a liquid,
- allowing easier spreading, and
- lowering of the tension between two liquids, or between a liquid and a solid. examples of surfactants
 - ✓ Detergents,
 - ✓ foaming agents
 - ✓ and wetting agents are surfactants.
 - ✓ Chelating agents, such as phosphates, are chemicals that sequester minerals — the culprits in hard water.

Page 18 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Sodium carbonate and sodium per carbonate are the most common alkaline chemicals found in cleaning products, being very effective in dislodging heavy deposits from tank walls or removing greasy residues. These products often incorporate surfactants and/or sodium metasilicate, an effective flocculant used in wastewater treatment which also inhibits corrosion. A dilute 1% solution of either chemical is sufficient for most applications. Sodium percarbonate has the advantage of dissolving tartrates and neutralizing acetic acid in problem barrels; sodium carbonate is not recommended for barrels as it excessively leaches key **oak** compounds.

Sodium carbonate does not dissolve easily; so first dissolve the powder in warm — not hot — water and then dilute the solution to the required concentration by adding the proper amount of cool water. Use the solution to wash equipment, leaving the solution in contact with the surface for at least 10 minutes.

Sodium percarbonate is commonly found in household laundry detergents. In water, it dissolves to release sodium carbonate and hydrogen peroxide, a very effective disinfectant and bleaching agent on most materials. It is highly recommended for cleaning oak barrels and for removing excess tannins, and particularly in treating barrels affected by spoilage microorganisms. Store sodium percarbonate solutions in a properly stoppered glass container as hydrogen peroxide tends to break down quickly.

Examples of products that contain sodium carbonate and/or sodium percarbonate include PBW (Powdered brewery Wash),

One Step

No-Rinse Cleaner (known as Aseptox in Canada), B-Brite Cleanser and OxiClean, a popular household detergent used by home winemakers and homebrewers.

Caustic alkaline chemicals, notably sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash), are very effective for washing tanks. For most stains, a 1% solution with a short-soak period of 15 minutes followed by a light scrubbing will work well; increase the concentration up to 5% for tough stains. But be careful as these chemicals are very corrosive and detrimental to many other metals and materials, especially glass. They are also extremely hazardous to humans; they can cause permanent skin burns or cause blindness.

Page 19 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



In all cases, a thorough rinse with a 1% citric acid solution is recommended to neutralize any alkaline residues.

Sanitizing Agents

Sanitizing products incorporate a range of chemicals that inhibit or kill contaminating microorganisms.

Potassium and sodium metabisulfite, more commonly referred to as sulfite or KMS in the case of the potassium powder version, are the most widely used and most effective sanitizing agents for winemaking applications.

Though sulfite powder dissolves much more readily in hot water, this is not recommended as it reduces the effectiveness of sulfur dioxide. Use a 10% sulfite solution by allowing the solution to be in contact with the equipment for approximately 10 minutes, no longer on stainless steel and silicone bungs as it can cause pitting and cracking with extended use. You can increase the sulfite solution's sanitizing effectiveness by adding equal parts of citric acid. The solution can be reused for several weeks if stored in a properly stoppered container.

Safety

Cleaners and sanitizers can potentially be hazardous. Always read the instructions and use them safely.

Never mix chemicals unless your instructions tell you to do so.

Mixing chemicals can, in some cases (such as mixing ammonia with bleach), release toxic fumes. Only use chemicals in a well-ventilated area. If needed, wear gloves, aprons and safety goggles. (Generally, gloves are all you need with most winemaking cleaners or sanitizers, but more protection should be worn when using strong chemicals such as caustics.)

The Material Safety Data Sheet (MSDS) for each product will supply information about its safe use, including first aid. Cleaning winery equipment is not a carboy of fun, but a clean carboy can hold a lot of amazing wine.

Maintenance

The maintenance of bottle washer is essential, day to day as well as periodical inspection, repair and replacements. The clogging of jets is a frequent problem and this has to be inspected daily, through leak proof inspection doors provided at the sides of the enclosure. Safe lighting is provided inside the bottle washer for this purpose. The steam pressure, water jet pressures are to be maintained. If the motors or pipelines are forming scale, it has to be removed. Spillage of water jets outside the bottles to which they are directed to must be avoided, due to lack of sufficient

Page 20 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



pressure or excess pressure. The chain conveyor movement should be ensured for smooth movement, without any excess of friction at various wheels provided for change of direction. Steam condensate traps must be inspected for proper operation and draining of condensate. The strainers provided before jetting rows are to be cleaned time to time.

Page 21 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 2		Written test
--------------	--	---------------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (point)

Test II: Short Answer Questions (points each)

Page 22 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 3- Fitting and adjusting machine components

Bottle

Technical performance wine bottles have to survive a number of process stages including:

- transport from glass manufacturer to filling line
- the filling process;
- transport to final market and on to the consumer
- And consumption and disposal.

Bottles must technically perform well at all these stages, with very low failure rates. Beyond impact on yield, excessive bottle failure can result in significant line down time, and potentially consumer injury. It is sometimes assumed that lighter weight bottles will suffer higher rates of failure than their heavier counterparts as they often have thinner walls. However, lighter bottles are often formed using a different technology, 'Narrow Neck Press and Blow' (NNPB), which gives improved process control and a more even glass distribution than heavier bottles made using 'Blow and Blow' technology, without detriment to fitness for purpose. An example of this is the introduction of a lightweight 70cl spirit bottle during the Container Lite project¹⁸.

The trialling of a few hundred new bottles before full product is a good way to spot and iron out technical problems before a design is finalised. Such trialling might include:

Fitness for purpose testing - new bottles are invariably tested to ensure fitness for purpose. This may take the form of the glass manufacturer's in house tests, and independent third party tests. For champagne and sparkling wines, a fitness for purpose performance standard dealing with carbonated beverages is applicable. The UK glass industry relies on British Glass' 'Tec 7'19 standards for strength and performance for the manufacture and use of carbonated beverages;

Filling line testing - such tests assess how well a light weighted bottle will handle and fill on the filling line. Additionally, test equipment is now coming to market which allows testing of the line itself, identifying areas of excessive impact or force, which might cause bottle failure, thereby allowing for engineering improvements to the line; and „ transit testing - examines how well a bottle stands up to the transport stages it will experience in the supply chain, possibly involving road and sea transport. Various test houses can simulate the conditions a bottle might experience through its supply chain (for example vibration / humidity), and can evaluate how the bottle would perform during and after such transit. Such testing is generally of

Page 23 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



whole pallets or bottle packs. Under this project a review of bottle strength was been performed to examine this issue in the context of light weighting)

Page 24 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 3	Written test
----------------	--------------

Name..... ID..... Date.....

Name..... ID.....Date.....

Directions: Answer the questions listed below.

Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers



Information Sheet 4 - Checking and adjusting equipment performance

Importance of checking equipment performance

Applications for machinery performance monitoring machines and systems for which performance monitoring surveys may be required on a routine basis include the following items:

- Pumps – due to impeller wear, seal ring wear (re-cycling) or blockage.
- Fan Systems – due to filter blockage, blade fouling or re-cycling.
- Boilers – due to loss of thermal efficiency for many different reasons.
- Heat Exchangers – due to fouling or blockage.
- Steam Turbines – due to blade fouling and numerous other reasons.
- Air Compressors – due to wear, filter blockage, valve leakage (reciprocating), etc.
- Diesel or Gas Engines – due to loss of compression (rings or valve leakage) etc.
- Electrostatic or bag dust filters – due to fouling, shorting or leakage.

Performance Monitoring of Pumps

A typical set of centrifugal pump curves is shown opposite. Pump manufacturers extensively test every pump on a calibrated test tank and produce accurate performance curves. A typical diagram giving the correct names for the parts of a centrifugal pump is also given. For any given liquid the variables shown on these performance curves are as follows:

- ✓ Total Head (discharge minus suction) expressed as a vertical dimension (e.g metres) or as pressure differential.
- ✓ Power Consumed (shaft power).
- ✓ Efficiency
- ✓ Flow
- ✓ Impeller Type
- ✓ Shaft Speed
- Performance Monitoring of Fans

Like pumps, fans are usually supplied with duty curves which, depending on the quality of the fan, may be actual test results or just estimates from design. The measurable parameters for a fan are as follows:

- ✓ Motor current and hence, an estimate of shaft power.
- ✓ Shaft speed.
- ✓ Pressure differential – using a manometer or electronic differential pressure device.
- ✓ Flow – if flow transducers are fitted.

Page 26 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 4	Written test
----------------	--------------

Name..... ID.....

Date.....

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (point)

Test II: Short Answer Questions () points each

Page 27 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Page 28 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



Information Sheet 5- Carrying out pre-start checks

Safety should always be the top priority in a facility with production machinery. Proper safety measures help to ensure that workers are safer, and it's simply a smart business practice. Shutting down a machine, factory or jobsite to address a safety incident can be expensive in terms of lost work time, lost revenue, as well as possible insurance issues. Safety incidents can also cause additional obstacles in terms of reports, audits, or legal issues.

A step towards a safer work environment starts with creating a culture that puts safety first, beginning with the management and supervisors setting the right example. Management can demonstrate that they take safety seriously. For example, if the company president visits the Machine Safety Checklist

Having a safety checklist on hand can help the workers to verify that a worksite is safe. There are many topics related to machine safety that should be considered in any safety plan. These include:

- Mechanical hazards
- Electrical hazards
- Other hazards
- Protective equipment
- Maintenance and repair
- Safeguards
- Training

Most of the safety practices in all of these areas are common sense. The challenge on any factory floor or jobsite is to get in the habit of checking everything every time you use a machine. Often the operation of a machine becomes second nature to a worker, they may not consider what could go wrong or that they are not following the best practices for their own safety.

Here's a machine safety checklist with questions that can be reviewed regularly. This covers both safety equipment and components, such as limit switches on the machines, but equally important are practices and policies so the workers take the additional steps necessary to avoid putting themselves in jeopardy.

Ensure your machines are checked before they are used.



Prestart Check List

The prestart checklist ensures the driver assessments are recorded and saved - this acts not only as a verification that checks are done, but also an accountability measure for Drivers to take responsibility for their machine.

General

1. The buildings and grounds should be maintained in an orderly, hygienic, and neat and tidy condition with a routine pest inspection and control program.
2. 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 environmental legislation.

External

- The grounds should be kept clean and free from rubbish at all times.
- 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.
- 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.
- 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 such occurrences should be reported and repaired promptly A thorough pest control program should be undertaken to keep vermin and other animals from entering buildings and processing areas.

Internal

- 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.
- All storage and despatch areas should be regularly inspected for possible cross contamination or damage to raw materials/finished product.

Page 30 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- 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.
- The plumbing should be kept in a sound state and all fittings should be of an approved sanitary type.
- The lighting should, at all times, be adequate to meet safe work standards, especially in the processing areas, to ensure safe operation of the equipment and to assist with cleaning. Light fittings should be enclosed wherever possible.
- All equipment should be installed so that easy access is possible for operating, servicing and routine 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.
- Any rubbish container within the winery should be secure from rodents and other pests, and should be regularly emptied.
- 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
- All personnel 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
- All toilets should be well ventilated, kept clean, and suitably supplied with hand washing sanitiser, hot water at 55°C and drying facilities.
- 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.
- All light fittings in the bottling and processing areas should be sealed to ensure that glass cannot fall into the processing area at times of breakage.
- There should be adequate equipment washing facilities readily available and in near proximity to the bottling and processing areas.
- There should be sufficient storage and separation for all raw materials and finished product/s so that each item can be clearly identified and not suffer deterioration. They should also be stored securely under lock and key, and kept separate from cleaning chemicals and other materials. Incompatible materials should not be stored together.

Page 31 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Adequate security and reconciliation procedures should be implemented for any chemical or biological materials at risk of diversion for illicit purposes identified by Science Industry
- A preventative maintenance program should be established to ensure that equipment is routinely inspected and that only food grade materials are used, that any hazardous waste is removed, and that production and processing equipment is left in a clean state fit for use.
- Food containers, including wine bottles, must never be used for the storage of non-food materials, such as lubricating oils and cleaning agents.

Equipment

- All equipment should be suitable for its intended purpose.
- 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.
- 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.
- Thorough cleaning and sanitising SOPs should be established, documented and followed to ensure that equipment is clean, and contamination of product with cleaning and sanitiser residues is prevented.
- All equipment which comes into contact with grapes, must, juice or wine should be cleaned and sanitised prior to and promptly after use.
- Equipment should be installed in such a way as to minimise the possibility of contamination and cross-contamination.
- All lubricants used in places where seepage or leakage to grapes or wine is possible should be approved for use in food processing by the US Food and Drug Administration. Care should be used in the lubrication of equipment to avoid contamination of product with lubricants.
- Where a primary and secondary refrigerant is used for cooling fermentations, checks should be made to ensure prompt detection of leaks should they occur.

Page 32 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Glass laboratory equipment, including thermometers, must not be used in the winery. Mercury-in-glass thermometers must not be used in the winery. Digital or mechanical dial thermometers are preferable.
- Fixed pipelines should be clearly labelled or identified to prevent potential cross contamination of a wine. They should be completely free draining so as to prevent any retention of residual pockets of wine or cleaning fluids.
- Filling and corking equipment should be designed to prevent damage to bottles particularly in the neck and bore mouth region.
- Pre-processing checks of all equipment and facility cleanliness should be made.

Page 33 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 5	Written test
----------------	--------------

Name..... ID.....Date.....

Directions: Answer the questions listed below.

Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers.

Information Sheet 6- Confirming services

Page 34 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Water and steam supply

Opportunities to avoid, reduce, re-use or recycle water should be considered as per environmental hierarchy. Examples could include:

- avoiding the use of water for bottle rinsing by using air knives;
- reducing the volume of water used for tank cleaning through a CIP system; or
- recycling rinse water at the bottle rinser

Clean water shall be used for all grape contact activities including:

- the application of foliar sprays (agrichemicals) to grapevines prior to harvest;
- clean down of harvest and transport equipment; and
- the incorporation of vineyard additives. 3. Potable water shall be used to:
 - clean and/or sanitise product contact surfaces such as processing equipment, storage vessels, transfer lines and filling equipment;

Good manufacturing practice for incorporate additives and processing aids to wine and/or wine product; and

- Purge product through processing equipment and transfer lines.
- Potable water may be derived from:
 - municipal supply direct to the point of use, that is, mains pressure pipeline;
 - municipal supply together with on-site buffer storage;
 - clean water treated to potable standard within the facility; and
- It is recommended that back flow protection is installed to prevent product ingress contaminating the water supply and a monitoring program to assure the quality of the water outside of the municipal system.
- Food grade boiler water treatment chemicals shall be used where steam/hot water is used for cleaning and sanitation of product contact equipment.

Water supply.

Page 35 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



The water supply shall be sufficient for the operations intended and shall be derived from an adequate source. Any water that contacts foods or food-contact surfaces shall be safe and of adequate sanitary quality. Running water at a suitable temperature and under pressure as needed shall be provided in all areas where the processing of food, the cleaning of equipment, utensils, containers or employee sanitary facilities require them.

Steam

It is important when timing sterilization to begin the timing sequence when the water temperature is reached and can be maintained for the specified period. Monitor temperature at the coldest point in the system. Manufacturer's recommendations for bottling line preparation should be followed to prevent damage to parts, seals, gaskets, and filters. Sanitation and sterilization quality control is monitored by frequent sampling (swabbing with plating) from various locations on the bottling line.

Self-check 6	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Page 36 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Test I: Choose the best answer (6 point)

A. quality

Test II: Short Answer Questions

LG #44	LO#2-Operate and monitor the bottle, plastic and keg washing process
Instruction sheet	
This learning guide is developed to provide you the necessary information regarding the following content	

Page 37 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



coverage and topics:

- Starting and operating the process
- Inspecting and washing empty bottles, plastic jars and keg
- Transferring washed bottles , plastic jars and keg to inspection
- Identifying variation in equipment operation
- Identifying , rectifying and reporting out-of-specification
- Maintaining the work area
- Conducting work within environmental guidelines
- Maintaining workplace records

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Start and operate the process
- Inspect and wash empty bottles, plastic jars and keg
- Transfer washed bottles , plastic jars and keg to inspection
- Identify variation in equipment operation
- Identify , rectifying and reporting out-of-specification

Page 38 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Maintain the work area
- Conducting work within environmental guidelines
- Maintaining workplace records

Learning Instructions:

- 10.** Read the specific objectives of this Learning Guide.
- 11.** Follow the instructions described below.
- 12.** Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
- 13.** Accomplish the “Self-checks” which are placed following all information sheets.
- 14.** Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
- 15.** If you earned a satisfactory evaluation proceed to “Operation sheets
- 16.** Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
- 17.** If your performance is satisfactory proceed to the next learning guide,
- 18.** If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Page 39 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 1- Starting and operating the process

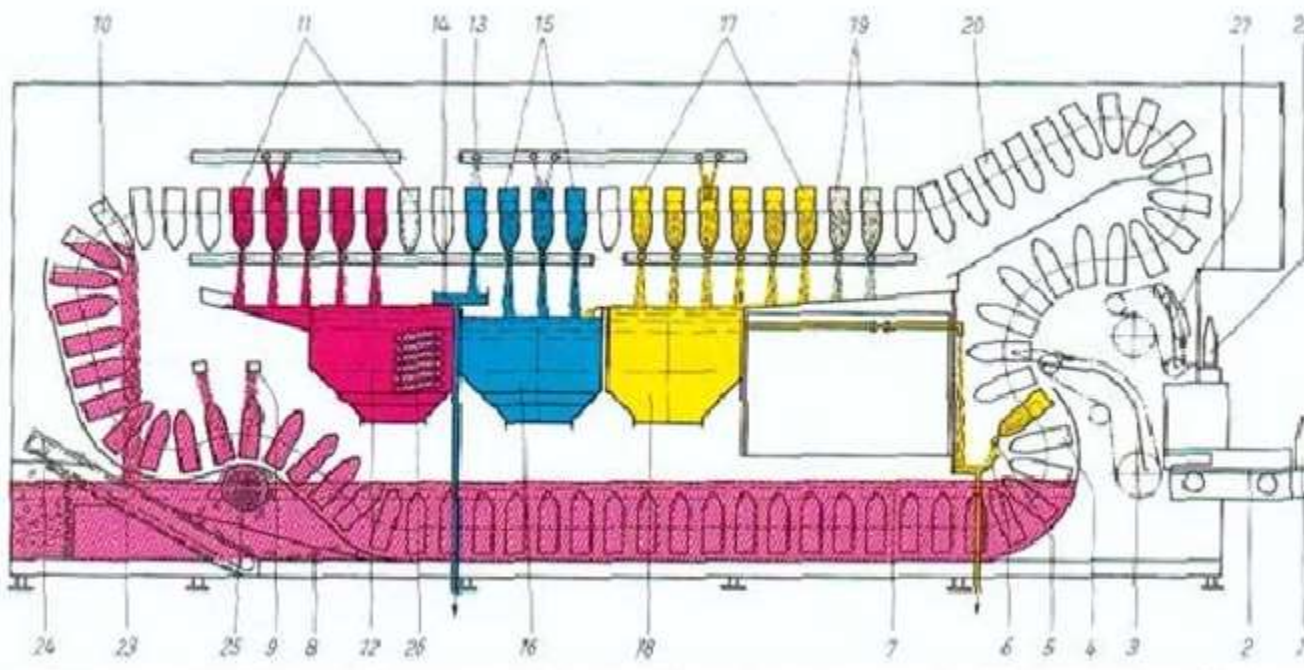
Prestart systems checklist

Prestart checks must be made to ensure equipment is not damaged on startup and also to prevent possible injury to

- Personnel during start up, the operational status of safety systems must be checked.
Check that equipment is plugged in correctly. For example you should never use double adapters to plug in multiple devices. If more than one device needs to be connected to power you would always use a power board.
- Ensure that the electrical cords are in good condition and not frayed or broken
- Ensure that equipment is properly ventilated. Most machines can get very hot and need to have a proper airflow around them to avoid damage.
- Start equipment in accordance with the organizations or manufacture’s guidelines.
- Use safety guards or safety clothing (if applicable). Some equipment can have areas that can cause injury such as cutting blades and overheated areas. They will generally have safety guards or may require safety clothing (such as eye or ear protection) to be worn. You should also;

Page 40 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

- Log on and off equipment (where applicable) in accordance with the organizations producers. This is to ensure security of the information contained in computers or other equipment that contains confidential information.
- Never try to repair a computer or clear paper jams in a photocopier while the machine is still turned on. This could result in injuries such as electrocution if the machinery is faulty
- Turn off all equipment when it is not in use. This prevents machines from overheating and perhaps causing damage, and saves on cost.
- Using business equipment in an unsafe manner is a hazard, not only to your own health and safety, but also to those around you, and possibly even the premises.



1. Bottle entering

Page 41 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



2. Insertion table
3. Insertion
4. Bottle carrier
5. Pre-spraying (40°C, 2.8bar, 2m³/h),
6. Collection of waste water
7. Soft base (65°C for RF detergent , 50-55°C) for RDF detergent,
8. Suction room with cullet collection
9. Label rinsing
10. End of the washing process
11. Spraying base (80°C 3.4 bar, 50m³/h)
12. Spray base bath with heating and pump
13. Intermediate spraying (50°C, 2.8bar,3.5 bar, 3.5 m³/h)
14. Collection bath for intermediate spraying with overflow
15. Warm water(50°C, 2.7 bar, 27 m³/h)
16. Warm water bath with heating and pump
17. Warm water(25°C. 3.5 bar50m³/h)
18. Warm water bath with pump
19. Fresh water spraying (12°C, 2.5 bar, 6.4m³/h)
20. Dripping off zone
21. Bottle delivery
22. Bottle delivery conveyor
23. Label sieve
24. Blast pipe
25. 25/26 heating

Page 42 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Page 43 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

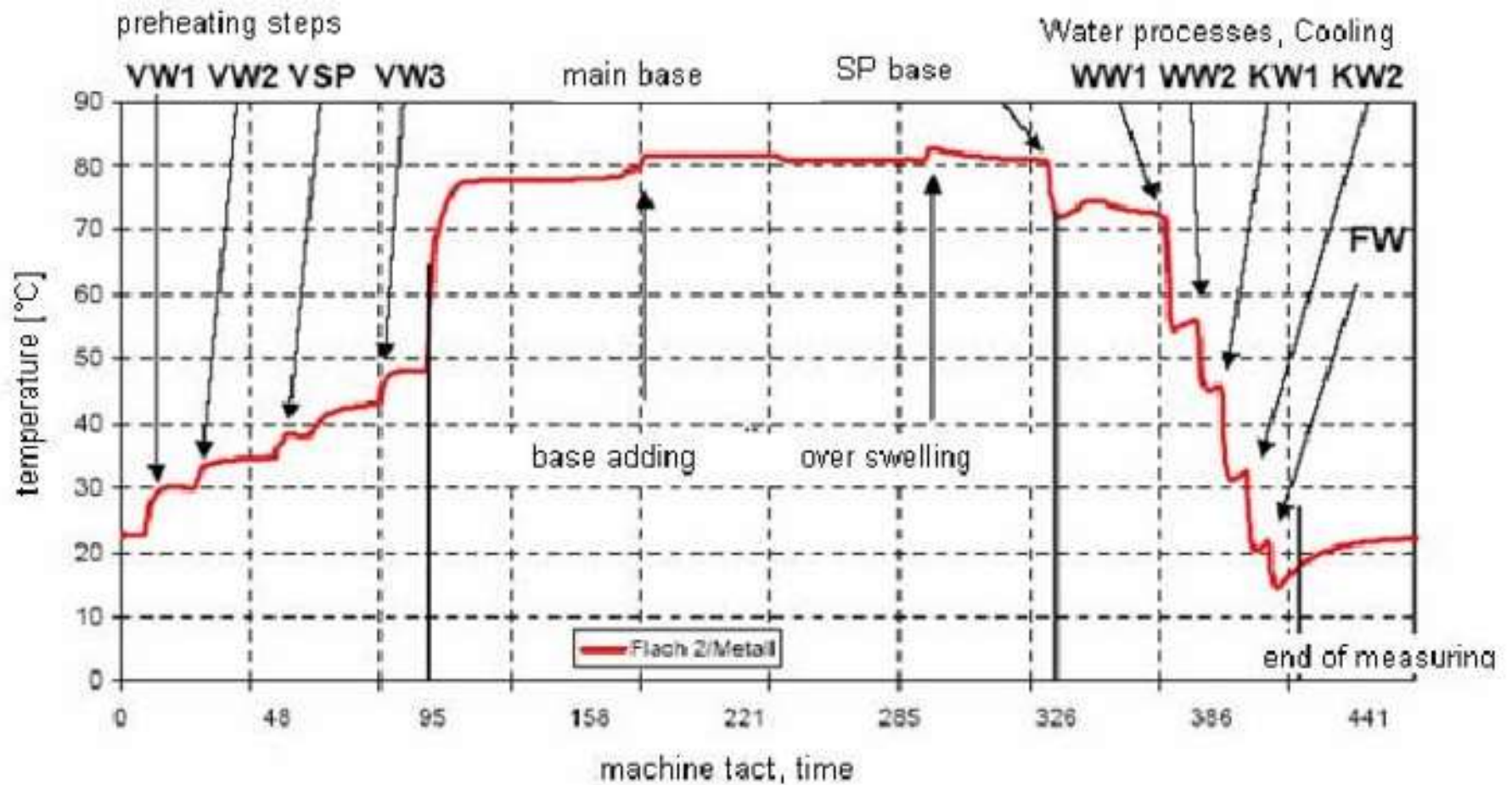


Figure. Temperature profile of the cleaning process

4. COMPETITIVE TECHNOLOGIES AND ENERGY SAVING POTENTIALS

a) Changes in the process

Page 44 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Multistage bottle cleaning:
- The multistage bottle cleaning is presented below

The individual zones of the multistage bottle cleaning process are the following:

1. Soak,
2. Caustic bath,
3. 1st zone of hot water tank,
4. 2nd zone of hot water tank,
5. Cold water tank,
6. Fresh water tank.

This cleaning process, which takes place primarily in the soaking zone and the caustic bath, results in clean germ bottles. The interaction of chemical, thermal and mechanical effects ensures that the bottles are cleaned within a certain time. Water consumption varies, depending on the bottles and their amount of dirt. Apart from the high water consumption, other disadvantages of the conventional bottle cleaning machines were, e.g. scale formation in the hot water zones and alkali entrainment; the need for expensive complexing agents and disinfectants and the fact that these chemicals can get into the waste water. These are eliminated with this multistage combination process. Even with a 51% reduction in fresh water input, the return of the cooled water still ensures reliable cooling of the bottles. This method is considered economically viable only in cases where a water saving of 200ml per bottle cleaned is needed.

Self-check 1	Written test
--------------	--------------

Page 45 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

Test II: Short Answer Questions (point each)

Page 46 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



Page 47 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 2- Inspecting and washing empty bottles, plastic jars and keg

Introduction

In olden days the retail milk supply was mostly done by glass bottles, which were reuse type and needed washing operations, before refilled and distributed for milk supply. As the bottles were mostly ½ litre capacity, the numbers of bottles were huge, for supply to even a medium size city. Hence, mechanized bottle washing was necessary not only to clean the bottles in large numbers, but also to do so safely, without harm to the personnel. Bottle washers of various types and sizes were in use, and the appropriate one was chosen to match the requirement of the dairy. Most popular among these bottle washers was the soaker type where bottles are soaked and jetted by an apron carrying bottles in various sections. Among the soaker type, there are again two types, one in which the feeding of bottles and the exit of cleaned bottles are at the same end of the bottle washer, and second in which, they are in the opposite ends. The sequence of operations of a typical soaker type bottle washer is given below.

Soaker Type Bottle Washer

In this type of bottle washer, the bottles are loaded in to a continuous conveyor chain that will be having rows of bottle holders. The conveyor chain passes through various stages of cleaning and sterilizing like:

- Pre-soaking
- Jetting
- Detergent soaking
- Flushing
- Rinse water jetting
- Hot water jetting
- Warm water jetting

Page 48 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- Cold water jetting.

The bottle washers may be of loading and unloading on same end, or it may be on opposite ends.

All the changes in direction of the conveyor chain are guided by chain wheels, which are provided with bearing boxes of plastic material. The shafts are made of stainless steel and all bearings in the machine are self-lubricating. The temperature of sections where heating is required is supplied with heating coils having steam flowing in it, with condensate drain through steam traps.

The sections are so arranged that there is a time – temperature treatment by each section. The temperature variations never exceed 25°C in spite of high cleaning temperatures used in the process. This will avoid any thermal shocks to the bottles, thereby reducing breakages. There are no acids involved. The total time taken for the bottle to get cleaned and return after passing through all sections is about 15 to 20 minutes depending on speed of the conveyor chain movement.

Description of Operation

The bottles are loaded on the loading table, which is a flat chain made of stainless steel. The bottles are loaded by distribution mechanism which guides the bottles in to individual bottle holders of each row. Each row may be having 8, 12 or 16 receptacles, depending on the Bottle washer capacity. The Tipping cradle ensures that the bottles are loaded in inverted position in the receptacles. The Tipping mechanism is also provided with safety switch, which will stop the movement of chain, if any of the bottles gets stuck between the tipping cradle and the conveyor chain. This avoids breakage of bottles when the conveyor moves to receive next set of bottles.

The conveyor chain takes the bottles first in to Pre-soaking section, where the water at 35°C, wets the bottle and its inner surface and loosens any leftovers sticking to it. Next it moves to jetting section, where hot water is jetted at 55°C into bottles to dislodge any particles still sticking to its surface. The chain then moves into Detergent soaking section, where hot detergent at 75°C will dissolve the fat and any greasy substances on the surface of bottle. The bottles are then flushed out of detergent solution, and move to jetting sections, where the detergent solution is jetted into bottles with force. The bottles then move over water jetting sections, designed to progressively remove the detergent remnants and reduce the temperature of bottle. These involve rinse water jet (65°C), hot water jet, warm water jets (35°C) and then cold water jet (15°C).

Page 49 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



The bottle is then discharged in vertical position by flat stainless steel belt conveyor to bottle filling section, with a hood on the conveyor to avoid any direct exposure to outside contamination. The conveyor is positioned with an observation point where magnifying glass is provided for visual inspection and eliminating any bottles with minor cracks, chipping at mouths or bottom to avoid damage and breakage during filling operation and further crating, storage and loading operations.



Figure. Bottle washer (soaker type)

Page 50 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Chlorine compounds, citric acid, 70% v/v EtOH, TSP (sodium triphosphate), and alkaline cleaners are used to clean and sanitize the equipment. The primary methods used to attempt sterilization of the bottling lines are hot water, dry heat (thermal conductivity), and ozone. Dry-heat sterilization consists of heating the bottling system's metal parts via thermal conductivity to a temperature of 82°C (180°F) for approximately 30 min.

The ozone chemical sterilization method uses ozone gas as an oxidizer to eliminate microbes throughout the bottling lines by injecting a volume of the gas into the system followed by a 20-min water flushing.

Because ozone is a toxic gas, it can cause severe irritation to the skin and eyes. Many wineries prefer to use the standard hot-water method of sterilization despite the safety hazards associated with extremely hot water or steam.

Hot-water sterilization consists of heating water to above 82°C (180°F) and flushing it through a clean bottling system for a minimum of 30 min, maintaining 82°C throughout the system.

Table 1. Bottling line sanitation and common procedure

Equipment	Cleaning	Sanitizing	Sterilization
Filter	Hot-water rinse	<ul style="list-style-type: none">• Flush with caustic cleaner• Citric acid rinse for 10 min• Water rinse for 15 min	(alkaline, TSP*) for 15 min 82°C (180°F) for 30 min
Filler bowl	Hot-water rinse	<ul style="list-style-type: none">• Hypochlorite wash for 15min• Hot-water rinse for 15 min• Citric acid rinse for 15 min	Hot water 82°C (180°F) for 40 min



		<ul style="list-style-type: none"> • Hot-water rinse for 15 min 	
Lines and hoses	Sodium triphosphate (TSP)	<ul style="list-style-type: none"> • Hypochlorite wash for 90 min • Citric acid rinse for 15 min • Hot-water rinse for 15 min 	Hot water 82°C (180°F) for 90 min
Corker (jaws: disassemble for sanitizing and sterilization)	70% EtOH	<ul style="list-style-type: none"> • Hypochlorite wash for 15 min • Citric acid rinse for 15 mi • Hot-water rinse for 15 min 	Hot water 82°C (180°F) for 20 min, or steam for 45 min, or iodine soak
Bottle Spurger (nitrogen purge)	Vacuum 70% EtOH		70% EtOH soak for 10 min



Self-check 2	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

Test II: Short Answer Questions (point each)

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points



Information Sheet 3 - Transferring washed bottles , plastic jars and keg to inspection

Bottle transport

The bottles are conveyed in rows through the machine in bottle cell carriers. The feeding of the bottle carriers occurs either.

- in cycles from one spray head to the next or as is always the case with large machines
- Continually. .

In both cases one speaks of cycle time. This is the time

- from one station to the next,
- for the bottle in feed of row as well as
- the bottle removal row

This is generally about 3 to 4 seconds and determines the through flow of the bottle washing

Possible bottle visual controls

If a bottle has not already been rejected, one can now use additional procedures to reject bottles

Are too tall or too short

Have a different color

Have different diameter or contour or

Have particular characteristics marking them out as foreign bottles

Today, bottle inspection is carried out exclusively electronically, by means of several CCD matrix cameras

The empty bottles inspected are rotary or through type machines

Carry out:

Rotary type run the empty bottles on a circular path during inspection

Page 55 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

- exactly defined guidance of the bottles including complete rotation
- a sidewall contro1 with higher resolution, particularly if a line camera is used.
- For different bottle forms, however, additional formal parts are necessary. which necessitates longer adjustment times, extra costs and storage space
- Moreover, cleaning and maintenance are more costly with these machines

Through type machines guide the bottles for inspection past the individual stations on the conveyor belt.

This, too; has advantages and disadvantages:

- The investment costs arc less. but
- the bottles must be presorted for size recognition and
- the bottles have to be treated individually as with the rotary machine

Ways to inspect bottles

Empty bottle inspector

Today, bottle inspection is carried out exclusively by electronically, by means several CCD matrix cameras.

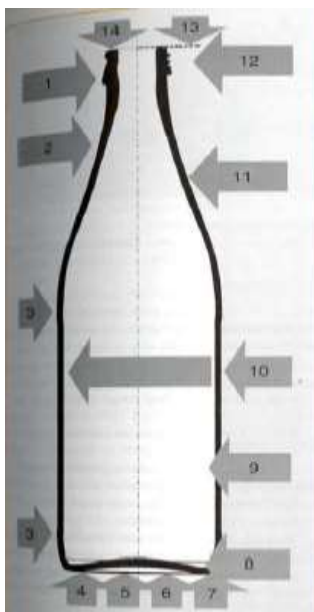


Figure. Ways to inspect glass bottles

- 1) side way mouth inspection
- 2) foil detection : side wall
- 3) abrasion detection
- 4) foil detection: bottom

Page 56 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------

- 5) bottom inspection
- 6) glass splinter detection
- 7) bottom breakage detection
- 8) caustic detection
- 9) liquid detection
- 10) residual inspection
- 11) contour detection
- 12) thread inspection
- 13) container height detection
- 14) sealing surface inspection

Empty bottle inspectors for glass boules are built as rotary or straight running machines and contain

- one or two cameras with a mirror and/or rotation system to capture the outer sidewall
- a camera [0 inspect bottom
- Camera to control the mouth.
- a high frequency caustic detector
- an infrared residual liquid detector,
- a camera to control inner sidewall and
- For screw tops: a camera to control the thread.

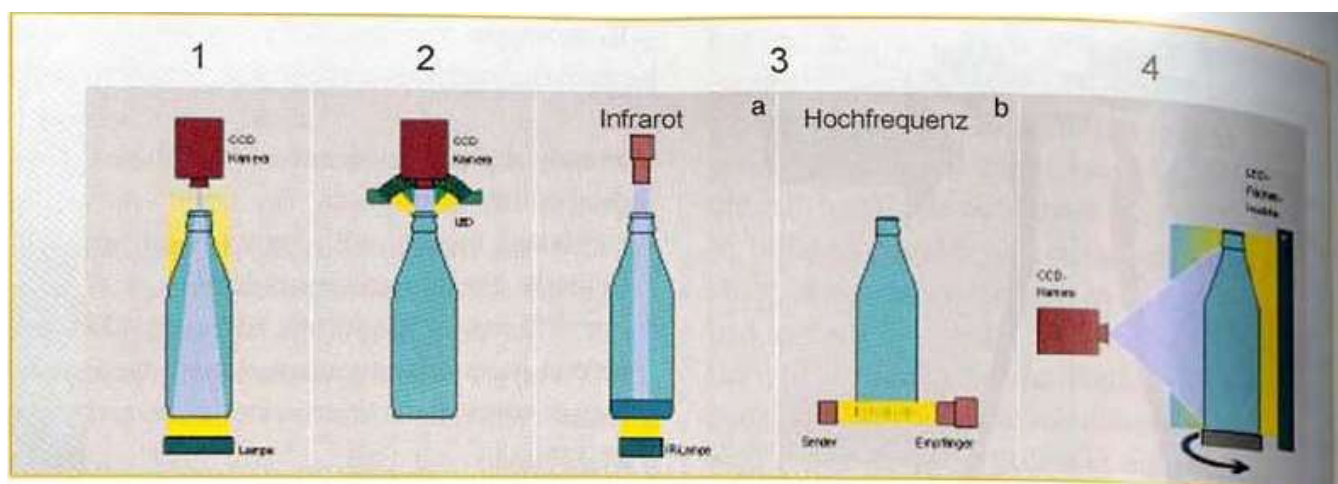


Fig. Empty bottle inspection

(1) Bottom inspection, (2) sealing surface inspection, (3) double residual liquid detection,

Page 57 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



b = high frequency, (4) sidewall inspection

Outer sidewall control

When controlling the outer sidewall, all irregular features which should not be on the bottle are to be recorded, such as label, foil residues, still sticking on, other impurities or scratches on the surface.

Mutual abrasion, known as scuffing, plays a special role. Particularly at places where boules are brought together. Corner stations and belts with several tracks with different speeds, it can happen that bottles rub together, resulting in increasing scratching of the surface.

In order to protect the labels and to limit the scratches, bottles are in many countries equipped with a barely visible thickening in the top and bottom area. This reduces the scratching in these cases to two rub rings, which with increasing rubbing become ever broader and narrow the appearance of the bottle.

Detection of the scuffing rings is difficult wet bottles

In order to control the outer sidewall properly the bottle is rotated

By 360° in front of a light source, in the case of a rotating machine, and in this time a digitalized photo of bottle surface, in 256 shades of grey, is taken by the CCD camera using 9 photos.

The evaluation of these photos takes place at maximum of 10 inspection windows; for every window a separate algorithm with different sensitivity can be chosen.

Bottles with scuffing, for example, are rejected here with through type machines, two CCD cameras each take 6 views of the bottle surface displaced at 30°. The bottle is hereby rotated by 180°. In all cases, the exposure time is adjusted to the transparency of the bottle glass, whereby in several zones different level of sensitivity and evaluation algorithm can be setup.

The bottles are evaluated according to particular evaluated threshold values

Bottom control

The bottom is controlled using a CCD matrix camera with illumination by a halogen lamp or stroboscope lamp, combined with a polarization filtration.

For the bottom control, the bottle bottom is subdivided into zones, which can be equipped with different algorithms and levels of sensitivity. The camera system is equipped with brightness compensation which evens out the color differences of the individual bottles. The evaluation of the bottom can be made in zones of different intensity:

Page 58 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020

- Ring evaluation. e.g. contamination of the edge zone, glass damage
- Block evaluation.
- Particularly y of the edge zones
- radial evaluation, particularly of beverage residues
- Brightness evaluation. e.g. for blocked edge bottle neck, completely covered bottoms
- foil detection for transparent foils or glass splinters.

Also particularly important here is the control of cracks in PET bottles. Bottles with a relatively large number of stress cracks are rejected.

Mouth control

The bottle mouth are the most complicated and at the same time the most vulnerable parts of the bottle. Hence there must be above all a control of breakages, cracks, fissures or contamination which can stop the bottle from being completely sealed up when it is closed again or can harm the consumer e.g. through glass damage or splinters



Figure bottom inspection

The following are therefore controlled:

- The closure thread on bottles with screw or twist tops and
- The mouth sealing surface

Page 59 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------

Control of the closure thread

The light source used to for controlling the closure thread is either a stroboscope with light transmitter or a side lamp. Evaluation is made in each case using a CCD matrix camera.

Control of the mouth sealing surface

- broken parts or the scaling surfaces
- Broken glass at the mouth.
- Cracks and fissures in the glass.

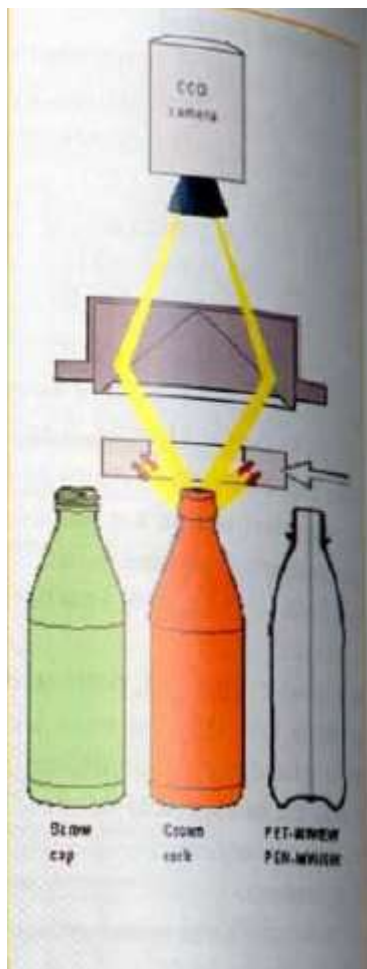


Figure. Bottle mouth inspection

Inspection of the empty cans result of their very low wall strength, empty cans are sensitive to deformations which can easily occur during transportation, as well on storage and removal from storage. If the *top* edge of the can is not perfectly round. The closer will crash.

Page 60 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------

Damage leads to a loss of production, the manufacture of waste goods and a loss of image with the customer.

Before filling the empty cans therefore have to be checked

- Roundness of the can
- Deformation of the flange at the top of the can.
- deformation of the can walls and bottom the can
- faults in the interior coating, and
- Foreign bodies in the inside of the can.



Figure. Can parts

(1) inspection of the bead.

(2) Side wall inspection,

(3) Inspection of the can bottom,

(4) Inspection of the standing surface

Page 61 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 3	Written test
----------------	--------------

Name..... ID.....Date.....

Directions: Answer the questions listed below.

I. Choose the best answer

1Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers

Page 62 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 4- Identifying variation in equipment operation

Keeping these facts in mind, every laboratory needs to implement a solid PM program geared for each piece of equipment in the laboratory. Without a PM program that is strictly adhered to, the quality and confidence of analysis generated will surely deteriorate. Additional benefits resulting from instituting a PM program include the following:

- Decrease in the variation of test results
- Fewer breakdowns during production hours
- Lower repair costs
- fewer service calls
- Prolonged life of the instrument
- Saved time troubleshooting problems
- Confidence builder for operator

Backup for questionable analysis

To set up a PM program, thoroughly read all instruction manuals for equipment used in the laboratory and note the manufacturers' recommended maintenance program. Attempt to place equipment in protected draft-free areas of the laboratory, keeping the ambient temperature at 20°C. Many electronic instruments are adversely affected by temperature change. Routine maintenance for most devices should include a wipe down of the exterior and thorough dusting (compressed air) of keyboards, inlet ports, electrical connections, heat fins, and internal wiring (always check with manufacturer's recommendations). As far as electrical instrumentation and some other equipment are concerned, dust is not a friend. Buildup of dust can lead to overheating of electrical components, create blockage of small orifices, and could alter or interfere with some analysis especially those that detect particle size. Many pieces of equipment are air-cooled with filtered ambient air that will require the filters to be cleaned or changed on a routine basis. Keep instruments and equipment covered when not in use. Always rinse equipment tubing or chambers when the analysis is complete. Wine, juice, reagents, controls, and standards can cause degradation of susceptible parts (O-rings, seals, etc.) in some instruments. Wine and juice can also cause the buildup of sugars or tannins, leading to

Page 63 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



blockage of small orifices in equipment. Set up log books for each piece of equipment or instrument to document PM activities, including the following:

- Equipment information

Purchase date and company Serial and model numbers Vendor and catalog numbers for supplies and parts Service department contact. List of warranties and service agreements with renewal dates.

Major maintenance

- Cleaning requirements
- Corrective action
- Identification of problems Corrective action taken Resolve of the problem
- Accountability initials of person performing the PM and date
- Maintaining service and repair records Frequent inspection of logs by supervisor Log books should be kept close to their corresponding piece of equipment or instrument.

Raw data encompasses analysis results and their computations and verification of accuracy, procedures, methods, actions, and observations.

Page 64 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Page 65 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



Self-check 4	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

Test II: Short Answer Questions (point each)

Page 66 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 5- Identifying, rectifying and reporting out-of-specification

Out-of-specification product or process outcomes

Handling of Out-of-Specification Results Analytical results indicating that the quality parameters of starting materials or product outcomes do not meet the specification are considered to be out-of-specification results (out-of-specification -results). There shall be a procedure describing the handling and investigation of such results, in which the following aspects shall be considered and covered:

Step 1 Investigation of the validity of the analytical result, in order to detect a potential analytical error or sample problem, which would render the out-of-specification -result invalid. When an out-of-specification -result is obtained, all material used for the analytical operations shall be kept for further investigation. A checklist should be available, based on which the laboratory result shall be scrutinized. The check-list should contain questions related to:

- the use of the right method and material (e.g. instruments, reagents, chemical, glass-ware) - adequate training of the technician
- the correctness of calculations, and
- any potential abnormalities of the sample.

When the checklist answers indicate that there was an analytical error or sample problem, the Out-of-Specification -result should be considered invalid and a new analysis should be started. If there is no indication of an analytical error or sample problem, the next step of the investigation is initiated.

Step 2: Re-analysis of the original sample preparation. (Remark: There are cases in which reanalysis may not be possible or feasible, e.g. a sample preparation may be consumed or aged with regard to the analyte. In such instances, no re-analysis must be performed, but re-testing, Step 3, has to be performed.) The re-analysis may either confirm the Out-of-Specification -result or lead to results complying with the specification. In the latter case, an investigation shall be performed to find the reason for the previous Out-of-Specification -result. Re-analysis results, which are in specification, may not overrule the 28 quality manual on micronutrient powder. Previous Out-of-Specification -result without further investigation. Should it be decided that the previous Out-of-Specification result should be disregarded, a rationale should be provided. In any case, an adequate number of re-analysis results should be available; in general, less than six results are not considered adequate. If the out-of-specification -result is confirmed by re-analysis, the next step of the investigation is initiated.

Page 67 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Step 3: Re-testing of further portions of the sample. The re-testing may either confirm the Out-of-Specification -result or lead to results in specification. In the latter case, an investigation shall be performed to find the reason for the previous out-of-specification -result. Retesting results which are in specification may not overrule previous Out-of-Specification -results without further investigation. Should it be decided that previous out-of-specification -results should be disregarded, a rationale should be provided. In any case, an adequate number of re-testing results should be available; in general, less than six results are not considered adequate. If re-testing confirms previous Out-of-Specification -results, the sample shall be considered out-of-specification and an investigation for the reason shall be initiated in manufacturing, and New, additional samples should be analyzed.

Step 4: Analysis of new, additional samples The analysis of new, additional samples may either confirm previous Out-of-Specification -results or lead to results in specification. In the latter case, an investigation shall be performed to find the reason for the previous Out-of-Specification -result. Part of this is the investigation in manufacturing. Analytical results obtained on new, additional samples, which are in specification, may not overrule previous OOS-results without further investigation and consideration, given that Step 3 confirmed that the initial sample, at least, was Out-of-Specification. Further investigation is required into the Root Cause of the sample being Out-of-Specification. The procedure describing the four steps of investigation should require documentation of each step and the approval of decisions by adequately qualified and authorized personnel. As a general rule, it shall be defined that no Out-of-Specification -results shall be excluded from the evaluation of starting material or product quality without a rationale or sustainable justification for such exclusion.

- Control of non-conforming products

The organization shall ensure procedures exist to investigate the cause of significant non-conformity against standards, specifications and procedures, which are critical to product quality and safety.

Corrective actions taken should be undertaken in a timely manner to prevent further occurrence of non-conformity and should be accurately documented, assigning responsibility and accountability.

The operator shall establish a documented procedure for dealing with products that do not comply with the intended requirements. This includes:

- ✓ Identification of product and batch code;
- ✓ Documentation
- ✓ Evaluation of the cause
- ✓ Segregation of batch or batches

Page 68 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- ✓ Disposal of products; and
- ✓ Internal information of relevant parties.

The responsibility for review and disposal of the non-conforming product shall be defined and documented.

A non-conforming product shall be reviewed in accordance with documented procedures by one of the following ways: Rework;

- Reclassification or dispensation; or
- Rejection and subsequent destruction or disposal.

The archiving procedure following non-conforming responsive actions needs to be defined and the records kept accordingly.

The approval and use of reworks (e.g. from quality rejects, customer returns or spillage) must always be considered within the HACCP system. Potential reworks, which are not approved, become waste material and must be dealt with accordingly. The amount added as rework is controlled to assure that there is no compromise to product quality and safety. If products and/or raw materials are rejected and not put into circulation for reason of non-compliance with specification or any other reason connected with their quality or acceptability, their disposal, destination or return to supplier must be recorded. The operator shall ensure all non-conforming products are clearly identified, labeled and quarantined when appropriate.

Page 69 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 5	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Define out off specification products and out comes?
2. Write Control methods of non-conforming products?

Page 70 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 6- Maintaining the work area

Good housekeeping is an important part of safety and accident prevention. Many unsafe conditions can be corrected before they result in injury. Good housekeeping is a necessity for a safe and sanitary kitchen. A clean work environment leads to pride in workmanship and a safe operation.

Workplace Housekeeping

Effective housekeeping can help control or eliminate workplace hazards. Poor housekeeping practices frequently contribute to incidents. If the sight of paper, debris, clutter and spills is accepted as normal, then other more serious hazards may be taken for granted. Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste materials (e.g., paper, cardboard) and other fire hazards from work areas. It also requires paying attention to important details such as the layout of the whole workplace, aisle marking, the adequacy of storage facilities, and maintenance. Good housekeeping is also a basic part of incident and fire prevention. Effective housekeeping is an ongoing operation: it is not a one-time or hit-and-miss cleanup done occasionally. Periodic "panic" cleanups are costly and ineffective in reducing incidents.

- Effective housekeeping results in:
 - ✓ reduced handling to ease the flow of materials
 - ✓ fewer tripping and slipping incidents in clutter-free and spill-free work areas
 - ✓ decreased fire hazards
 - ✓ lower worker exposures to hazardous products (e.g. dusts, vapours)
 - ✓ better control of tools and materials, including inventory and supplies
 - ✓ more efficient equipment cleanup and maintenance
 - ✓ better hygienic conditions leading to improved health
 - ✓ more effective use of space
 - ✓ reduced property damage by improving preventive maintenance
 - ✓ less janitorial work
 - ✓ improved morale
 - ✓ improved productivity (tools and materials will be easy to find)
- Poor housekeeping can be a cause of incidents, such as:
 - ✓ tripping over loose objects on floors, stairs and platforms
 - ✓ being hit by falling objects
 - ✓ slipping on greasy, wet or dirty surfaces
 - ✓ striking against projecting, poorly stacked items or misplaced material

Page 71 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- ✓ cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails, wire or steel strapping

To avoid these hazards, a workplace must "maintain" order throughout a workday. Although this effort requires a great deal of management and planning, the benefits are many.

Good housekeeping program plan

A good housekeeping program plans and manages the orderly storage and movement of materials from point of entry to exit. It includes a material flow plan to ensure minimal handling. The plan also makes sure that work areas are not used as storage areas by having workers move materials to and from work areas as needed. Part of the plan could include investing in extra bins and more frequent disposal.

The costs of this investment could be offset by the elimination of repeated handling of the same material and more effective use of the workers' time. Often, ineffective or insufficient storage planning results in materials being handled many times and being stored in hazardous ways. Knowing the workplace layout and the movement of materials throughout it will help when planning work procedures.

Worker training is an essential part of any good housekeeping program. Workers need to know how to work safely with the products they use. They also need to know how to protect other workers such as by posting signs (e.g., "Wet - Slippery Floor") and reporting any unusual conditions.

Housekeeping order is "maintained" not "achieved." Cleaning and organization must be done regularly, not just at the end of the shift. Integrating housekeeping into jobs can help ensure this is done. A good housekeeping program identifies and assigns responsibilities for the following:

- ✓ clean up during the shift
- ✓ day-to-day cleanup
- ✓ waste disposal
- ✓ removal of unused materials
- ✓ inspection to ensure cleanup is complete

Do not forget out-of-the-way places such as shelves, basements, sheds, and boiler rooms that would otherwise be overlooked.

The final step to any housekeeping program is inspection. It is the only way to check for deficiencies in the program so that changes can be made.

Page 72 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 6	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

1. which of the following is the characteristics of good housekeeping standard
 - a. Change burned-out light fixtures in work areas, walkways, and exits.
 - b. Keep floors and work areas clean, dry, and grease-free
 - c. Keep steps and ladders in serviceable condition
 - d. All of the above

Test II: Short Answer Questions (3 points each)

1. Write some of good housekeeping indicators?
2. Describe house keeping records and importances?
3. Describe the characteristics of poor house keeping records?

Page 73 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 7- Conducting work within environmental guidelines

Apply cleaner production methods – reduce, recycle and segregate wastewater at its source for easier treatment, more efficient wine making and greater profit.

Treat wastewater to be 'fit for purpose' – get it to the standard required for its next-use

Recycle wastes or dispose of them safely – get value from wastes and reduce the risk of environmental harm by recycling, e.g. recycled water can be a valuable asset for irrigation or industrial use.

Promote best practices and proactive problem solving - train and empower staff for low-cost improvements and solve problems early. Diagnose the specific causes of individual problems but seek integrated solutions and, if in doubt, consult an expert.

Pollution Prevention and Control

Pollution prevention and control is best practiced through effective management, maintenance and housekeeping of a process that incorporates water conservation and recycling, energy conservation, and disposal of solid wastes as by-products. Some options that may be considered include: use clean-in-place (CIP) methods for decontaminating equipment;

- use high pressure, low volume hoses for equipment cleaning;
- dispose of spent material as animal feed, either 80% wet or dry after evaporation;
- dispose of wet hops by adding them to the spent grains;
- dispose of spent hop liquor by mixing with spent grains;
- use spent yeast that is not reused for livestock feed;
- add trub to spent grains;
- recover spilled beer and add to spent grains that are being dried through evaporation;
- filter tank bottoms from final fermentation tanks and use as animal feed;

reduce energy consumption through reuse of wort cooling water as the process water for the next mash
send broken glass, bottles that cannot be used, and waste cardboard to recyclers

Consideration should be given to the use of non-phosphate containing cleaning agents. Breweries have a favorable steam to electricity ratio and consideration should be given to inclusion of cogeneration in the design and operation of the brewery

Treatment Technologies

Where the brewery does not discharge to a municipal sewer then primary and secondary treatment of the effluent is required.

Page 74 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Primary treatment facilities may include: pH adjustment; roughing screens; grit settling chambers; and a clarifier. Choices of processes to remove BOD in a secondary treatment stage include: anaerobic treatment followed by aerobic treatment and activated sludge systems.

Sludges from the clarifier are dewatered and disposed through incineration, or to an approved landfill.

Where the brewery is permitted to discharge to a municipal sewer, pretreatment may be required to meet municipal bylaws and/or to lessen the load on the municipal treatment plant. In some cases, sewer discharge fees imposed on effluent volume, and on the suspended and BOD loads, by the municipality may encourage the brewery to install its own treatment facility.

Modern plants using good industrial practices are able to achieve the following in terms of pollutant loads: Water conservation and recycling will allow water consumption to be controlled to a minimum. A new brewery should target on achieving an effluent range of 3-5 m³/m³ beer produced. Provision for recycle of liquors and reuse of wash waters will help reduce the total volume of liquid effluent. A new brewery should target on achieving a treated effluent that has less than 0.3 kilograms (kg) of BOD₅/m³ beer produced and 0.3 kg of suspended solids/m³ beer produced (assumes discharge to receiving waters

Odor emissions can be minimized if exhaust vapors are condensed before they are released to the atmosphere or if they are sent to the boiler and burned.

Page 75 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 7	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (3 points each)

Page 76 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 8- Maintaining workplace records

Maintaining workplace records with workplace recording requirements

Records/reports records provide evidence that the relevant specifications and /or instructions have been complied with. Records should be made or completed at the time each action is taken. Any change to a record should be approved, signed and dated by authorized persons.

The level of documentation will vary depending on the product and stage of development. The records should enable the entire history of a batch to be traced. Additionally, the records/reports should form the basis for assessment of the suitability for certification and release of a particular batch.

As a minimum, the following should be documented:

- Receipt records for each delivery of raw materials, starting material, bulk, intermediate as well as primary packaging materials. The receipt records should include: - name of the material on the delivery note and the containers as well as any “inhouse name” and or internal code if appropriate, supplier’s name and manufacturer’s name supplier’s batch or reference number total quantity received; - date of receipt unique receipt number assigned after receipt; and - any relevant comment.
- A batch processing record should be kept for each batch processed; it should contain the following information:
 - name of the product and batch number;
 - dates and times of commencement, of critical intermediate stages, and of completion of production;
 - quantities and batch number of each starting material;
 - quantities and batch number of critical raw materials;

where applicable, quantities and batch number of other materials that are used in the manufacturing process and that can have a critical impact on quality, , materials and consumables that have an inherent biological activity through which they can impact cells, such as coated dishes or beads);

Page 77 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- ✓ confirmation that line-clearance has been performed prior to starting manufacturing operations;
- ✓ identification (e.g. by means of initials or another suitable system) of the operator who performed each significant step and, where appropriate, of the person that checked these operations, a record of the in-process controls;
- ✓ identification of clean room and major equipment used; - the product yield obtained at relevant stages of manufacture; and - notes on special problems including details, with signed authorization for any deviation from the manufacturing instructions.
- ✓ Results of release testing.
- ✓ Environmental monitoring records.
- ✓ Outcome of self-inspections should be recorded.

Reports should contain all the observations made during the inspections and, where applicable, proposals for corrective measures. Statements on the actions subsequently taken should also be recorded.

Any deviations should be recorded and investigated, and appropriate corrective measures should be taken.

Other documentation

There should be appropriate documentation of policies and procedures to be applied by the manufacturer with a view to safeguard the quality of the product, including:

- Qualification of premises and equipment.
- Validation of manufacturing process
- Validation of relevant analytical methods.
- Maintenance and calibration of equipment.
- Cleaning procedures.
- Environmental monitoring.
- Investigations into deviations and non-conformances.
- Procedures for handling of quality complaints and recall of products.

Page 78 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Logbooks should be kept for equipment used for critical manufacturing and testing operations. The documentation of the above policies and procedures should be adjusted to the stage of development. The documentation for phase I and I/II clinical trials can be more limited but it is expected that it becomes more comprehensive in later phases of development.

A site master file should be prepared for every site involved in manufacturing of authorized. The site master file should provide a high level description of the premises, activities conducted at the site and of the quality system implemented.

Retention of documents without prejudice to section batch documentation (i.e. documents in the batch processing record, results of release testing, as well as -where applicable- any data on product related deviations) should be kept for one year after expiry of the batch to which it relates or at least five years after certification of the batch by the QP, whichever is the longest. For investigational medicinal products, the batch documentation must be kept for at least five years after the completion or formal discontinuation of the last clinical trial in which the batch was used.

It is acceptable that some of the data pertaining to the batch documentation is kept in a separate file, provided that they are readily available and are unequivocally linked to the relevant batch.

Critical documentation, including raw data (for example relating to validation or stability) that supports information in the marketing authorization, should be retained whilst the authorization remains in force. However, it is acceptable to retire certain documentation (e.g. raw data supporting validation reports or stability reports) where the data has been superseded by a full set of new data. Justification for this should be.

Page 79 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 8	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test II: Short Answer Questions (3 point each)

1. List the required documentation in document recording procedures?
2. Write appropriate documentation of policies and procedures to be applied by the manufacturer?
3. Describe record keeping and documentation activities?

Test II: Say true or false (2 points each)

1. The level of documentation will vary depending on the product and stage of development.
2. Records for each delivery of raw materials, starting material, bulk, intermediate as well as primary packaging materials are required?

Page 80 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



LG #45

LO #3- Shut down the bottle and keg washing process

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying shutdown procedure
- Shutting down the process
- Identifying and reporting maintenance requirements

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify shutdown procedure
- Shut down the process
- Identify and report maintenance requirement

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).



6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Page 82 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 1- Identifying shutdown procedure

All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock

Bottle washing plant must be maintained and repaired according to the manufacturer’s specifications or, in the absence of such specifications, in accordance with a competent person’s recommendations.

Plant should be isolated before maintenance or cleaning commences.

Where plant is isolated and plant shutdown will result, any total or partial shutdown should not allow a hazardous situation to be created. Isolated or disengaged plant should: not hinder or interfere with the operation of any other plant have guards in place where a risk of injury is identified, and not obstruct access.

A process should be put in place to enable effective communication and consultation with affected workers and other persons conducting a business or undertaking to prevent any risk to health and safety arising from restarting the operation of the plant which has been shut down due to inspection, maintenance or cleaning.

An energy isolation procedure should be developed to ensure that potential energy sources, that is, electrically charged conveyor, soaker and washer and water pressure are in a zero mechanical state prior to any maintenance or cleaning work being carried on plant items.

Page 83 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 1	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

Test II: Short Answer Questions (point each)

Page 84 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 2- Shutting down the process

Lock-out procedures work safe regulations require that all powered machinery or equipment shut down for maintenance or repair must be secured against the possibility of the equipment being accidentally turned on while being worked on. To safeguard the person working on such equipment, lock-out procedures must be posted near the equipment, and the procedures listed must be followed before repairs or maintenance can start. Locking out a machine usually means the power feeding the machine is disconnected either by pulling a plug, placing a switch in the off position, or turning a circuit breaker to the off position. The disconnected circuit is then secured in the inoperative position by the use of a padlock. The person doing the maintenance or repair keeps the key to this lock until the work on the machine has been completed. The worker then removes the lock and the machine is again operable.

Depending on the situation, the lock might be used to secure the power switch of the machine or it might be used to lock shut the door to a circuit breaker panel where the thrown breaker is located. If the machine is not wired into its own power circuit but simply plugs into the wall, the lock-out procedure may require that the machine be turned off with its power switch and unplugged from the power receptacle. The plug end of the machine must be kept in plain view of the repair person so no one can inadvertently restore power without the repair person's knowledge

Page 85 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 2	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (point each)

1. Identify the shutdown procedures
2. Describe machine parts related to shut down procedures

Page 86 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



Information Sheet 3- Identifying and reporting maintenance requirements

Preventative maintenance (PM) is orderly attention given to equipment to maintain accuracy and longevity by keeping them in prime working condition. The facts about equipment are the following:

- They do not last forever.
- They do get dirty.
- They do require calibration.
- They do directly affect QA.
- They do destruct.
- They do break down.
- They are not human.

Keeping these facts in mind, every laboratory needs to implement a solid PM program geared for each piece of equipment in the laboratory. Without a PM program that is strictly adhered to, the quality and confidence of analysis generated will surely deteriorate. Additional benefits resulting from instituting a PM program include the following:

- Decrease in the variation of test results
- Fewer breakdowns during production hours
- Lower repair costs
- Fewer service calls
- Prolonged life of the instrument
- Saved time troubleshooting problems
- Confidence builder for operator
- Backup for questionable analysis

To set up a PM program, thoroughly read all instruction manuals for equipment used in the laboratory and note the manufacturers' recommended maintenance program. Attempt to place equipment in protected draft-free areas of the laboratory, keeping the ambient temperature at 20°C. Many electronic instruments are by temperature change. Routine maintenance for most devices should include a wipe

Page 87 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



down of the exterior and thorough dusting (compressed air) of keyboards, inlet ports, electrical connections, heat fins, and internal wiring (always check with manufacturer’s recommendations). As far as electrical instrumentation and some other equipment are concerned, dust is not a friend. Buildup of dust can lead to overheating of electrical components, create blockage of small orifices, and could alter or interfere with some analysis especially those that detect particle size. Many pieces of equipment are air-cooled with filtered ambient air that will require the filters to be cleaned or changed on a routine basis. Keep instruments and equipment covered when not in use. Always rinse equipment tubing or chambers when the analysis is complete. Wine, juice, reagents, controls, and standards can cause degradation of susceptible parts (O-rings, seals, etc.) in some instruments. Wine and juice can also cause the buildup of sugars or tannins, leading to blockage of small orifices in equipment. Set up log books for each piece of equipment or instrument to document PM activities, including the following:

- Equipment information
- Purchase date and company Serial and model numbers Vendor and catalog numbers for supplies and parts Service department contact List of warranties and service agreements with renewal dates
- Scheduled maintenance Calibration Routine maintenance

Major maintenance

- Cleaning requirements

Corrective action

- Identification of problems Corrective action taken
- Resolve of the problem
- Accountability Initials of person performing the PM and date Maintaining service and repair records

Frequent inspection of logs by supervisor Log books should be kept close to their corresponding piece of equipment or instrument.

You **can never** check and recheck data, computations, conversions, formulas, or notations too many times. This attention to detail generates a tremendous amount of data that substantiates the accuracy and precision of all company procedures, reagents, standards, controls, equipment, and instruments.

Page 88 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Every detail that leads up to obtaining a test result is documented. Raw data encompasses analysis results and their computations and verification of accuracy, procedures, methods, actions, and observations.

Raw data include the following:

- Notebooks
 - Instrument printouts
 - Analytical record sheets
 - PM logbooks
 - Proficiency testing
 - Solution preparation logs
- Computer records have been a subject of controversy over the years. Many high-quality computerized instruments store their raw data files.

Analyses results are transferred to other forms in order to communicate those results to the appropriate requestor. To eliminate transcription errors

Common Faults and their Causes

Every day many faulty bottles of wine are opened and, sadly, nearly as many are consumed. Perhaps the drinker is not aware that the wine is faulty, or believes that it is not to his or her taste.

Very often there is a strong suspicion that something is wrong, but the buyer does not have the confidence to complain.

Maintenance

The maintenance of bottle washer is essential, day to day as well as periodical inspection, repair and replacements. The clogging of jets is a frequent problem and this has to be inspected daily, through leak proof inspection doors provided at the sides of the enclosure. Safe lighting is provided inside the bottle washer for this purpose. The steam pressure, water jet pressures are to be maintained. If the motors or pipelines are forming scale, it has to be removed. Spillage of water jets outside the bottles to which they are directed to must be avoided, due to lack of sufficient pressure or excess pressure. The chain conveyor movement should be ensured for smooth movement, without any excess of friction at various wheels provided for change of direction. Steam condensate traps must be inspected for proper operation and draining of condensate. The strainers provided before jetting rows are to be cleaned time to time.

Page 89 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-check 3	Written test
--------------	--------------

Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 point)

Test II: Short Answer Questions (point each)

Page 90 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



LG #46

LO #4-Record information

Instruction sheet :

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Recording workplace information
- Signing all records
- Communicating information record
- Keeping workplace information records

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Record workplace information
- Signing all records
- Communicate information records
- Keep workplace information records

Learning Instructions:

10. Read the specific objectives of this Learning Guide.
11. Follow the instructions described below.
12. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
13. Accomplish the “Self-checks” which are placed following all information sheets.
14. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the



Self-checks).

15. If you earned a satisfactory evaluation proceed to “Operation sheets
16. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
17. If your performance is satisfactory proceed to the next learning guide,
- 18.** If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Page 92 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 1- Recording workplace information

Records are 'information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business activity are generated and reflect what was communicated or decided or what action was taken. Ethical requirements.

Ethical principles and codes of practice must also be followed when collecting and processing workplace information. Organisational policies and procedures will outline consequences, such as disciplinary action, when ethical principles and codes of practice are not followed. Records management is 'the efficient and systematic control of the creation, receipt, maintenance, use and disposal of records, including processes for capturing and maintaining evidence of business activities and transaction. Records are retention for periods of time a specified period for which a record must be kept before it may be destroyed. Detailed records are taken of all tests results of winery (wine processing) addition of additives and finings, bench test results, effectiveness of additives and finings during crushing, pressing, fermentation, clarification, aging, bottling and the information is used to select and to adapt methods, the additives and finings in the beverage industry.

Page 93 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 1	Written test
----------------	--------------

Name..... ID.....Date.....

Directions: Answer the questions listed below.

I. Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers

Page 94 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Page 95 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
----------------	-----------------------------	---	-------------------------------



Information Sheet 2- Signing all records

All activities being recorded sign.

An all activities being recorded sign has effective messages to address security policy and protection concerns. An all activities being recorded sign is a helpful tool to help protect the health and safety of personnel, and is not a replacement for required protective measures for lessening or removing hazards. All activities which are undertaken starting from preparation of storage area to storing the raw materials should be recorded and signed by the concerned personnel. Workplace information is recorded clearly and accurately in the format and at the time required by the organization. Records provide the industry manager with data, information and knowledge.

All the record you put Accurately locate the appropriate recording mechanism for the information you need to record Where records do not currently exist, set them up, or work with the appropriate people to get them set up. Make entries into records that are accurate, complete and, in the case of written records, legible

- Record information within required timescales
- Store updated records accurately in the correct location
- Follow procedures when records are transferred to another location
- Maintain security and confidentiality of information recorded, in accordance with requirements
- Take the appropriate action to resolve or report any errors or omissions that are discovered in the records, or any problems with maintaining, storing or retrieving records

The systems for record keeping and storage used within the organization;

- The records which you are required to update and where they are located
- The correct format in which records must be completed
- When records should be completed
- The limits of your responsibility for handling and using records
- our responsibility under relevant legislation
- What the records are used for and the importance of accurate record keeping
- Procedures for transferring records
- Records that are confidential or commercially sensitive and how to deal with these

Page 96 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Types of records

Paper-based records are one of the most common ways of dealing with information. Examples of paper-based records include: reports, magazines, journals and newspapers, project files, Contracts, minutes of meetings business letters email messages and memos, faxes, Forms, diaries and other note-taking method. File and store information when you process information, you may be required to catalogue items in the filing system after you have collected, updated or modified them. You'll need to know:

- What information to keep
- the legal requirements of keeping the information
- your organization's filing procedures
- The security issues surrounding the information. Collection of information in laboratory sample examination

Page 97 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 2	Written test
----------------	--------------

Name..... ID.....Date.....

Directions: Answer the questions listed below.

II. Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers

Page 98 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Information Sheet 3- Communicating information records

Communicating information records

If work is being taken over by the next shift or another crew, a handover should occur. This involves discussing the stages, testing sample have been taken (e.g. turbidity, PH, alcoholic test, acidity, TDS, microbiological test etc.) the work is at and changing over locks and personal danger tags. The only worker who should remove personal danger locks and tags is the person who put them in place. A procedure should be available which first considers all options to allow the person who placed the lock and tag to personally remove them, consider emergencies and/or if the worker is unable to remove the lock. If the worker cannot remove the lock and tag, the employer should ensure: a senior person is accountable for the lock and tag the situation is assessed to be safe before removing the lock and tag ensure the removal is validated and signed off by two or more people. To do any activity ,technician should communicated with concerned body via necessary communication channels ,which may be upward and down ward or horizontally these may leads to avoid unnecessary production down time and other related messes. And after all you have to get a confirmation to go ahead maintenance activity, unless never do maintenance activity by yourself

Page 99 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Self-Check – 3	Written test
----------------	--------------

Name..... ID.....Date.....

Directions: Answer the questions listed below.

III. Write short answer/s

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers.

Page 100 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
-----------------	-----------------------------	---	-------------------------------



Information Sheet 4- Keeping workplace information records

Keeping track of information Storing information in a centralized area allows everyone to access information easily, whether it is paper-based or in electronic form. However, systems must be in place to control the movement of information so everyone knows where a file is at any moment.

In some organizations, file security is extremely important. These include:

- Organizations that keep sensitive information about their customers such as insurance companies
- Legal firms and government department's
- Organizations developing new products where information revealed to competitors may disadvantage the organization
- Files that are confidential, or have restricted access, are generally kept separate from the main filing system.
- Sometimes they are tagged to indicate their security rating (for example, general, personal, restricted, confidential, secret and top secret).
- Electronic files are more difficult to store separately
- Especially with a networked computer system
- So other measures are used such as password protection.

Methods used to keep confidential or restricted files secure include:

- keeping hard-copy files locked,
- storing confidential computer files on a CD or other storage device rather than on the hard drive (the CD can then be stored in a locked cupboard), Using encryption, a method in which the computer file is coded and requires a decoding key to open and translate the file.

If you require access to confidential or restricted files, you will need help to make sure you completely understand the policies and procedures for accessing such files.

It is particularly important that the movement of these files is accurately recorded to ensure they are not accidentally released into the wrong hands or lost. It is equally important to look after the organisation's files while you are using them. When files are out of the filing system, they

Page 101 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2 September, 2020
-----------------	-----------------------------	---	-------------------------------



should be kept in a safe place and treated with care. Don't leave documents lying unprotected on your desk, especially overnight. Place them in a folder, a desk drawer or a file. Be careful not to damage or remove material from a file. If something must be removed from a file temporarily (for example, to photocopy it) it should be recorded by using a marker, such as an out card, and returned to exactly the same place in the file.

Maintaining information and filing systems

- Keeping records up to date.
- All information within the system should be current and easy to access.
- Updating records is a day-to-day task for any organisation.
- The specific procedures for doing this may vary from place to place.
- Keeping records up to date might include modifying particular records by changing information or adding information to them. For example, updating:
 - additives and finings** sample taking procedures
 - Sample test procedures
 - Standards and specifications (set points).
 - Sample test reports
 - stock records to make sure they match the actual number of stock items
 - sales records to make sure they match the number of sales made
 - customer and supplier details to make sure the details are correct
 - account details to make sure the amounts owed by customers, and to suppliers, are correct
 - technical information to ensure it is current
 - Daily, weekly or monthly sales targets, to reflect current goals
 - regular specials lists or offers.
 Some records need to be updated when policies, procedures, legislation or regulations are changed. Part of your job may be to replace old information in the organisation's files with updated information. You need to do this correctly, so your organisation can easily access up-to-date information and carry out procedures in a lawful way. Inaccurate records can be worse than having no records at all.
 - ✓ Imagine what would happen if: Coding /lot was wrong
 - ✓ Testing procedure document was wrongly written
 - ✓ Name of sample tested raw materials was recorded incorrectly on the database
 - ✓ a customer's address or telephone number was recorded incorrectly on the database
 - ✓ a wrong 'received' date was stamped on an invoice sent to your organization

Page 102 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



- ✓ an invoice sent to one of your customers was recorded differently in the company records from the amount appearing on the invoice
- ✓ A file number was recorded incorrectly on the file index.
- ✓ Inaccurate records cause problems and confusion.
- ✓ If somebody looks at a record and the information is inaccurate or missing, at best they may need to spend time sorting out what the correct information is. At worst, it may affect the organisation's reputation; for example, customers may be upset
- ✓ Or accounts may not be paid on time. When updating a file, always double check: file codes the index to the filing system, dates ,Supplier name ,ype sample testing, raw material name, names, titles and addresses of supplier, Telephone, Fax , email and website addresses

Page 103 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



Reference

1. Wolfgang K. Technology Brewing and Mailing, Berlin 3rd completely updated edition, 2004
2. Adapted from Shea A. Red Wine Making Olin Schultz, 2008
3. Penfield, M., and Campbell, A. Experimental Food Science. 3rd edition. San Diego: Academic Press, Inc. 1990.
4. Adapted from Method 54-30A, Approved Methods of the American Association of Cereal Chemists, 10th Edition. 2000. St. Paul, MN.
5. Adapted from Shea A. White wine Making Olin Schultz, 2008

Page 104 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020



AKNOWLEDGEMENT

We wish to extend thanks and appreciation to the many representatives of TVET College/ Institutes Trainers and respective experts of Regional TVET bureau, Bishofitu management institute Librarian, UNESCO and Federal Technical and Vocational Education and Training Agency (FTVET) who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

We would like also to express our appreciation to the TVET College/ Institutes Trainers and respective experts of Regional TVET bureau, Bishofitu management institute Librarian, UNESCO and Federal Technical and Vocational Education and Training Agency (FTVET) who made the development of this Teaching, Training and Learning Materials (TTLM) with required standards and quality possible.

This Teaching, Training and Learning Materials (TTLM) was developed on September, 2020 Bishoftu management institute

The trainers who developed the learning guide

No	Name	Qualification	Educational background	Region	E-mail
1.	Mewleddeg girma	B	Food science and post-harvest technology	Sidama	mewegirma@gmail.com
2.	Biruktayt muluneh	B	Chemical engenering (process)	SNNPR	Edenwondimu12@gmail.com/
3.	Alemayehu araya	B	Food science and post-harvest technology	Addis Ababa	alemayohmr@gmail.com
4.	Mamo Abdi	B	BSC in agriculture	Oromiya TVET Bureau dev't Facilitator	Mamoab57@gmail.com
5.	Workneh Asmamaw	B	BSC in agri.economy	FTA dev't Facilitator	workalemaw@gmail.com

Page 105 of 105	Author: Federal TVET Agency	TVET program title- Alcoholic & Non Alcoholic beverage Processing	Version -2
			September, 2020