Confectionery Processing

Level-II

Based on *Oct 2019*, Version 2 Occupational standards

Unit of Competence: - Operating an Automated Cutting Process

Module Title: - Operating an Automated Cutting Process

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LG #57	LO #1- Prepare the automated cutting 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 cutters on the available machine
- Confirming wrapping papers on each available paper roller.
- Identifying and confirming the Cleaning and maintenance requirement status
- Fitting and adjusting machine components and related attachments
- Checking and adjusting production equipment performance.
- Carrying out pre-start checks.
- Confirming services and materials to meet available legislative 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:

- Confirm cutters on the available machine
- Confirm wrap papers on each available paper roller.
- Identify and confirm the Cleaning and maintenance requirement status
- Fit and adjust machine components and related attachments
- Check and adjust production equipment performance.
- Carry out pre-start checks.
- Confirm services and materials to meet available legislative requirements

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 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test”

Information Sheet 1-	Confirming cutters on the available machine

1.1 Confirming cutters on the available machine

Cutting machine is used to cutting and separating solutions cut and shape your sweet and savory wafers, your confectionery and your cereal and nut bars. Chocolate cutting machines which are easy to use and maintain. A range of machinery suitable from small to medium scale output through to large factories requiring bespoke equipment.

Automation or automatic control is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens.
The cutting characteristics of most turning applications are similar. For a given product only one cutting tool is used. This tool must overhang its holder to some extent to enable the holder to clear the rotating work piece**.** Highly automated machine tool capable of performing multiple machining operations and cutting products by changing cutting molder.

- Chucking Machine includes:-
  - Uses chuck in its spindle to hold work part
  - No tailstock, so parts cannot be mounted between centers
  - Cutting tool actions controlled automatically
  - Operator's job: to load and unload parts
  - Applications: short, light-weight parts
- Automatic Screw Machine includes:-
  - Same as automatic bar machine but smaller
  - Applications: high production of screws and similar small hardware items.

Fig1 confectionery cutting machine

Fig 2 confectionery cutter machine

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: Say true/false

1. Chocolate cutting machines which are easy to use and maintain. (3point)

Test II: Choose the best answer

1. Which one of the following is true about Chucking Machine? (3points)
   - A. Uses chuck in its spindle to hold work part
   - B. No tailstock, so parts cannot be mounted between centers
   - C. Cutting tool actions controlled automatically
   - D. All

Test III: Short answer

2. Write importance of chucking machine(4points)

_____

_____

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

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

Information Sheet 2- Confirming wrapping papers on each available paper roller.

2.1 Confirming wrapping papers on each available paper roller.

Wrapping papers is paper that is used to wrap gifts.

The wrapper protects the roll from damage, dirt and moisture, and prevents it from unwinding. All paper rolls do not have the same wrapping. The most common wrappers are made of Kraft or Kraft liner paper; plastic wrappers are also used. A typical wrapper consists of several paper layers and end plates, wound around the roll and glued together.

- ❖ The wrapper Barrier Protection:-
    - To keep moisture out and prevent wrapped paper from losing moisture.
    - To protect the paper from dirt or hygienic hazards, and against light degradation.

Paper roller is a roll of perforated paper for use in a mechanical instrument such as a player piano. Paper is a delicate high value product susceptible to damage and degradation. The numerous usage-specific paper and board products have different technical characteristics determined by many factors such as the type of fibers used, fillers, finishing and winding.

The combination of a paper's characteristics and its wrapping strongly influence its handling, logistics and storage. The primary function of the core is to support the paper roll; it must also be of sufficient strength and stiffness to prevent crushing during normal handling.

Some coated gloss rolls with lack of friction can lead to increase clamp pressure that can distort the roll. Plastic as well as functional paper can be used for bag production.

- ❖ The main purpose of the wrapper and the paper roll end cap is to protect the paper roll during its transport from the paper factory to the end-customer.

Mechanical protection: To prevent indentations from roll handling systems, and transport damages on truck, train and ship. The level of protection is influenced by the weight, quality and turns of wrapping.

Fig 1 wrapping paper

Fig 2 rolled paper

Fig 3 Wrapper paper

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: Say true/false

1. The wrapper protects the roll from damage, dirt and moisture, and prevents it from unwinding (3point)

Test II: Choose the best answer

1. The combination of a paper's characteristics and its wrapping strongly influence its? (3points)

A. Handling B. Logistics C. Storage D. All

Test III: Short answer

2. Write the importance of wrapper Barrier Protection (4points)

_____

_____

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

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

3.1 Identifying and confirming the Cleaning and maintenance requirement status

3.1.1 Identifying and confirming the maintenance requirement status

Automated cutting maintenance of production equipment in industrial enterprises plays an increasingly important role. It is quite obvious that it can eliminate a number of risks associated with the business and ensure effective use of financial resources necessary to ensure the working order of the machinery and equipment of the businesses.Maintenance is the upkeep of all automated machine, fittings and equipment to an exacting standard within the property so that all areas look consistently new and pristine.

Fig 1 maintenance process

Procedures of automated maintenance machine

- Identify automated maintenance machine area
- Prepare equipment which is used for maintenance purpose
- Shutdown the cutting machine line before starting maintenance process
- A standard maintenance procedure is a detailed list of steps that describes how to perform a maintenance task and is also a documented standard to which the job or task should be performed.

1.2 Identifying and confirming the Cleaning requirement status

- Cleaning is the removal of all visible soil in an approved way with the use of mechanical and chemical action or both, so that all areas are cleaned and sanitized to a high standard. Cleaning is an investment in the assets of a building. In order to clean at the right time, you will need to know the operating hours of all Production rooms.

Fig 2 cleaning process

Procedures of maintaining cleaning

1. Remove general waste.
2. Clean & disinfect all flat surfaces.
3. Clean & disinfect restroom.
4. Dust mop floor celli's
5. Stock supplies and perform final inspection:
6. Wet Mop floor

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: Say true/false

1. Maintenance of production equipment in industrial enterprises plays an increasingly important role. (3point)

Test II: Choose the best answer

1. _____ Cleaning is the removal of all visible soil (3points)

A. Cleaning B. Maintenance

C. A and B D. All

Test III: Short answer

2. Write the difference between cleaning and maintenance (4points)

_____

_____

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

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

Information Sheet 4- Fitting and adjusting machine components and related attachments

4.1 Fitting and adjusting machine components and related attachments

4.1.1 Fitting machine components and related attachments

Fitting is the process of applying craft methods such as skilled filing to the making and assembling of machines or other products. Fitting means ready, appropriate, or in keeping, whereas proper means suited or acceptable to the purpose or circumstances. Fitting is also noun with the meaning: a small part, especially a standardized or detachable part of a device or machine.

Fitting the equipment's follows the following points:

- Check for partially collapsed lines, leaks, or restrictions that would divert or
- Otherwise hamper the flow of water to the meter.
- Inspect gears, pivots, etc., for excessive wear.
- Check legibility of dials, numerals, and pointers.
- Correct any problems noted above before proceeding

4.1.2 Adjusting machine components and related attachments

Checking/adjusting the general layout of the plant before the equipment is erected to ensure efficient operation and adequate space for stockpiling and handling materials in compliance with specification requirements.

Adjusting the equipment's follows the following procedures:

a. Safety first for adjusting equipment

b. Use test equipment/ voltmeter for adjusting equipment

c. Separate the adjusting equipment

d. prepare equipment/cutter which is used for adjusting purpose

d. Adjust the equipment/cutting machine

Fig 1 Fitting and adjusting machine

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: Say true/false

1. Fitting is the process of applying craft methods (3point)

Test II: Choose the best answer

1. Fitting or adjusting the equipment's? (3points)

A. Inspect gears, pivots, etc., for excessive wear.

B. Check legibility of dials, numerals, and pointers.

C. Correct any problems noted above before proceeding

D. All

Test III: Short answer

2. Write at least two fitting or adjusting the equipment's points (4points**)**

_____

_____

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

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

5.1 Checking and adjusting production equipment performance.

5.1.1 Checking production equipment performance.

Checking measuring machinery health by performance monitoring has the potential to give warning of a developing failure through the changing levels of a suitable parameter being measured, thereby indicating a change in condition of a component, machine or system.

.

Automated cutter/production equipment performance include to:-

- dedicated single and/or multiple cutting equipment
- Shackles and conveyor systems
- Paper roller
- Heater
- Cooler
- wrapping paper
- Automatic cutting machine with accessories

Advantages of checking and adjusting cutting machine

- Counting Stress and Overload Conditions to check the machine problem

  One great benefit of performance monitoring electric cutter motors is:-

- To identify the frequency and number of times that they are overloaded.

5.1.2 Adjusting production equipment performance.

Adjusting production equipment performance is used to increase cutting equipment safety and ready for next production process.

Production equipment performance includes:-

- Lubricate each moving part once before turning it on. (Manipulator, robot guide, opening and closing guide all).
- The cutting machine has a large chain and a small chain to add lubricating oil once a month. Check whether the moving parts are firm before the production, whether the screws are loose or not, especially in places with strong impact.

- Check if the high pressure gas source, low pressure gas source, power source and water source are normal.
- Check each emergency stop switch, safety door switch, and protection device to check if the switch is normal.
- Check the lamp for damage and breakage. Replace it in time.
- Check if the pneumatic components are leaking and the action is sensitive.
- When the machine is being repaired, press the screen fault repair button to ensure safe maintenance.

The overall cutting/ production equipment performance procedure is as follow:

1. Safety first before starting adjusting cutting machine
2. Check the processing line of automatic cutter
3. Check the cutting breaker and the line before adjusting.
4. Adjust time and temperature of cutter.
5. Check production equipment performance.
6. Finally Set time and temperature in adjusting board.

Fig 1 Checking and adjusting equipment performance

Each overload causes stresses to the electric motor components and to those in the machinery it drives. Each overload stress destroys operating life of the parts and causes the motor and the attached machine to fail sooner.

❖ Condition Monitoring machine and Process characteristics which affect

- availability
- capacity
- quality
- safety
- Risk and cost can be continually evaluated throughout an asset's lifetime.

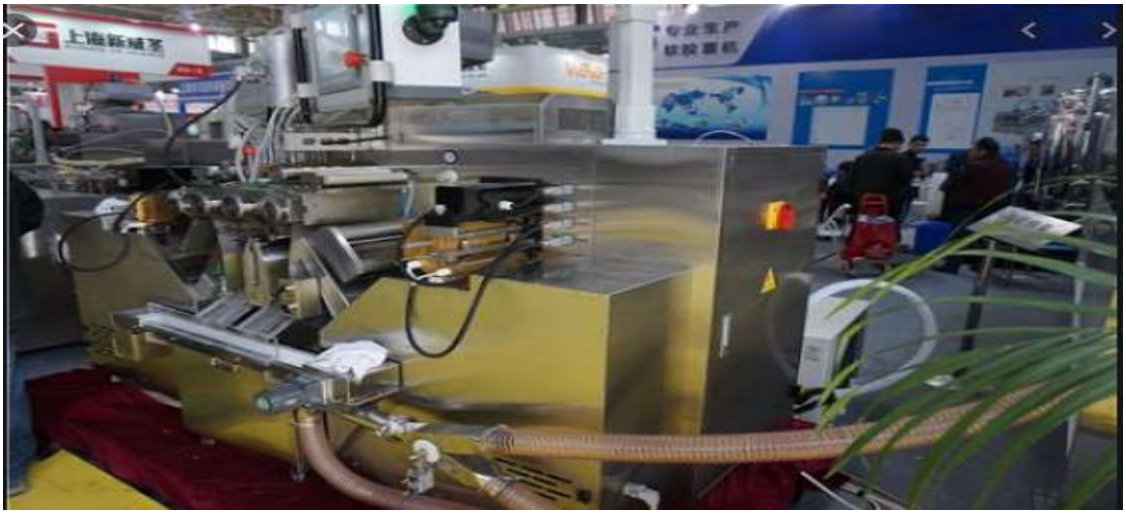

Fig 2 Automatic confectioner manufacturing machine

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: Say true/false

1. Identify the frequency and number of times that they are overloaded (3point)

Test II: Choose the best answer

1. Which one of the following Condition of monitoring machine and Process Characteristics? (3points)

   A. availability

   B. capacity

   C. quality

   D. All

Test III: Short answer

2. Write at least three automated cutter/ Production equipment (4points)

_____

_____

_____

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

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

6.1 Carrying out pre-start checks.

A pre-start inspection involves a routine examination of a piece of automated equipment by its operator that is standardized via a checklist. Whether it be a light vehicle, heavy vehicle, mobile plant or tools, pre-start inspections are an important task with financial, and more importantly, safety implications.

The purpose of an inspection is to identify whether work equipment can be operated, adjusted and maintained safely – with any deterioration detected and remedied before it results in a health and safety risk. The need for inspection and inspection frequencies should be determined through risk assessment.

❖ Checking the safety devices: Before starting the machine, the safety devices should be checked according to the following procedure:

- Correct operation of the emergency
- stop button, while the machine is working
- press the emergency button:
- the machine should stop immediately

Procedures of pre-start check

- ✓ The main disconnect
- ✓ Temperature settings and heat soak times
- ✓ Turn on downstream equipment
- ✓ Start the main drive at low rate
- ✓ Start the cutter at low rate
- ✓ Ramp up extruder/cutter and feeders to appropriate rate
- ✓ Increase the pelletizer speed to match rates.

Fig 1 pre-start check

- **Keys to pre-start checks including:-**
  - **Mechanical:**

All workers must have adequate PPE (Personal Protection Equipment). Generally, this includes, as a minimum, safety shoes, safety glasses, a hard hat, and work gloves.

- **Electrical:**

Review the wire wiring specification with the electrical contractor to ensure it follows the provided cabling and conduit-run instructions. Make sure all power is “locked out/tagged out” while the electrical work is being done.

Think through which machines are fixed and which are movable. Do not apply power to the main panel or any other parts of the system until the appropriate technician is on-site and has inspected the installation.

- **Filling and checking fluids**

Confirm that gear box in the system is filled with the correct grade of oil.

- **Safety checks**

A safety team must evaluate the installation for potential hazards and confirm that issues that being addressed systematically by the site’s safety/health program.

- **Start-up phase**

Before any production, a preliminary evaluation of the equipment is conducted.

- **Installation qualification:**

The first thing the technician should do upon arriving on-site is to inspect the installation work.

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: Say true/false

1. Preliminary operations check if the machine has been damaged during transport. (3point)

Test II: Choose the best answer

1. Which one of the following is true about Check the Cleaning of the machine (3points?)

A. Remove the dust and dirt deposited on the surface during transport.

B. Carefully clean and dry each part C.A and B D. All

Test III: Short answer

2. Write the purpose of an inspection (4points)

_____

_____

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

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

Information Sheet 7- Confirming services and materials to meet available legislative requirements.

7.1 Confirming services and materials to meet available legislative requirements.

Services materials mean those service related materials (including tools, documentation, special test equipment, and manuals) necessary for the cutting maintenance, repair and service of automated cutting.

7.1.1 Confirming services to meet available legislative requirements include to:-

- Power,
- water and
- Air

1. **Power:** where lighting is needed, florescent tubes use less electricity than bulbs, but care is needed when using fluorescent lights above cutter, mills, duellers and other equipment that has moving or rotating parts. This is because they can make machinery appear stationary at certain speeds, causing a hazard to operators.

2. **Water:** is used in bakeries to make dough and for washing equipment. An adequate supply

of potable (safe for drinking) water should be available from taps in the processing room. The drainage and sewage systems should be designed to prevent cross-connection of sewage with other wastes from the plant in order to avoid any potential for contamination

3. **Air**: In chocolate production, compressed air is essential. Even the system of tubes for conveying the chocolate masses to the casting units is controlled by pneumatically activated valves. Chocolate is a very sensitive foodstuff, and every effort must be made at the production and packaging stages to prevent contamination with even the faintest

7.1.2 Confirming materials to meet available legislative requirements include to:-

- Roped gum
- candy
- chocolate

Legislative requirements to this industry include:

- The Food Standards Code, including labeling, weights and measures

Legislation

- Legislation covering food safety, environmental management, OHS, anti-Discrimination and equal opportunity

GMP is guidelines for food processing and handling. GMPs include practices focused on the prevention and control of hazards associated with the fresh fruit and vegetable post-harvest chain, ensuring a safe and wholesome product.

Standard Operating Procedures (SOPs)

SOPs describe both technical and fundamental programmatic operational elements of an organization that would be managed under a work plan or a Quality Assurance (QA). SOPs detail the regularly recurring work processes that are to be conducted or followed within an organization. They document the way activities are to be performed to facilitate consistent conformance to technical and quality system requirements and to support data quality. If not written correctly, SOPs are of limited value. In addition, the best written SOPs will fail if they are not followed.

Fig. 1 service and automated materials

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: Say true/false

1. The Food Standards Code, including labeling, weights and measures Legislation (3point)

Test II: Choose the best answer

1. Which one of the following is true about legislative requirements? (3points)

A. Food Standards Code B. legislation covering food safety

C. Environmental management D. All

Test III: Short answer

3. List services and materials to meet available legislative requirements. (4points**)**

_____

_____

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

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

Operation Sheet 1- Carrying out Pre-start checks of automated cutting machine

Procedure

Step 1: Apply safety rules of laboratory/ processing plant (PPE)

Step 2: Prepare machine operation equipment and put in operating (checking) area.

Step 3: Check automated operating machine functionality

Step 4: Disinfect automated cutting machine by using recommended detergent

Step 5: Start the automated cutting machine operation

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task-1 Pre-start checks of automated cutting machine operation

LG #58	LO #2- Operate and monitor the automated cutting process

Instruction sheet

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

- Inspecting cutters to confirm quality
- Operating cutting processes in workplace *policies and procedures*
- Identifying cutting equipment operating conditions
- Identifying and reporting variation in equipment maintenance operation
- Monitoring quality and accuracy of cuts (product, paper)
- Identifying, rectifying and/or reporting out-of-specification outcomes
- Conducting the work
- Maintaining the work area
- 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:

- Inspect cutters to confirm quality
- Operate cutting processes in workplace policies and procedures
- Identify cutting equipment operating conditions
- Identify and report variation in equipment maintenance operation
- Monitor quality and accuracy of cuts (product, paper)
- Identify, rectify and/or report out-of-specification outcomes
- Conduct the work
- Maintain the work area
- Maintain workplace records

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 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test”

1.1. Inspecting cutters to confirm quality

Inspection – is a critical or official examination of automated cutting machine or something aimed at forming a Judgement or evaluation. The main purpose of inspection is to provide the client with objective, independent, and impartial information regarding the condition and safeness of the raw materials/machines suitable for further processing. Inspection or test points (control points) in the automated cutting process and the related procedures and recording requirements, such as recording information (e.g. temperatures and product codes).

❖ Uses of automated cutting machine quality standards includes:-

- Satisfying their customers' quality requirements
- Ensuring their products and services are safe
- Complying with regulations
- Meeting environmental objectives
- Protecting products against climatic or other adverse conditions
- Ensuring that internal processes are defined and controlled

Fig 1 cutters to confirm quality

Fig 2 cutting machine

❖ **procedures of inspecting quality of cutter machine**

1. Review current cutter inspection methods.

   The first step in reducing inspection costs is to review current inspection methods

2. Define the objectives or goals of the new cutter method.

   After reviewing current inspection systems, any evident problems and limitations in current methods of inspection can be used to develop a new approach.

3. Determine measurement equipment requirements.

   The next step in creating a new, cost-effective quality system is determining inspection needs.

4. Evaluate organization and solicit feedback.

   After reviewing current inspection methods, evaluate the organization and workflow. Listen to operators who use the equipment every day.

5. Organize data generation and management.

   The final step in reducing inspection costs is to look at how quality inspection data is generated and managed.

6. Inspecting quality of cutter machine

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: Say true/false

1. Inspection – is a critical or official examination of automated cutting machine (3point)

Test II: Choose the best answer

1. Uses of automated cutting machine quality standards include? (3points)
   A. Satisfying their customers' quality requirements
   B. Ensuring their products and services are safe
   C. Complying with regulations
   D. All

Test III: Short answer

2. Define Inspection (4points)

_____

_____

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

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

Information Sheet 2- Operating cutting processes in workplace policies and procedures

2.1 Operating cutting processes in workplace policies and procedures

2.1.1 Operating cutting processes

Cutting is manufacturing by removal of material. Particles of material, the chips, are mechanically removed from the raw material/from an unfinished part by cutting edges of a tool. Cutting processes work by causing fracture of the material that is processed. Usually, the portion that is fractured away is in small sized pieces, called chips. Common cutting processes include sawing, shaping (or planning), broaching, drilling, grinding, turning and milling.

2.1.2 Workplace policies and procedures in operating cutting processes include:-

- Safety first for operating cutting processes
- Shutdown the process line before operating
- Work is carried out according to company policies and procedures.
- Regulatory and licensing requirements.
- Legislative requirements and industrial awards and agreements.

2.1.3 The procedures of operating cutters process

- Keep all guards in place while operating the machine.
- While operating the milling machine allow no one else to touch it.
- Keep hands away from moving cutting tools.
- Do not make measurements of the stock while the milling machine is powered.
- Do not allow large quantities of chips to accumulate around the work piece or machine table. After stopping the machine, use a brush or rag to remove all excess chips from the mill bed and stock.
- Use a rag or Kevlar gloves to handle sharp cutting tools.
- Cutting tools must be securely fastened in the machine spindle with the proper accessory. Never try to tighten cutting bits or tools by hand.
- Do not power the machine to tighten or loosen cutting bits or tools.

- Work pieces and stock must be rigidly fastened to the mill bed with clamps, a vise, or special fixtures.
- Use appropriate speeds and feeds for the type and size of cutter being used and the material being machined.
- Make sure the cutting tool is clear of the work piece before starting the machine.

A standard operating procedure (SOP) is a set of step-by-step instructions compiled by an OS organization to help workers carry out complex routine operations.

Fig 1 Operating cutting processes

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: Say true/false

1. Cutting processes work by causing fracture of the material that is processed. (3point)

Test II: Choose the best answer

1. _____to help workers carry out complex routine operations? (3points)

A. Standard operating procedure B. SSOP C. None

Test III: Short answer

2. Define standard operating procedure (4points)

_____

_____

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

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

3.1 Identifying cutting equipment operating conditions

Cutting tools are a primary consumable for all manufacturing processes, and manufacturers' consumption of cutting tools parallels manufacturing activity in general, comparable to durable goods shipments.

Cutting speed: refers to the relative surface speed between tool and work, expressed in surface feet per minute. The work, the tool, or both, can move during cutting. Because the machine tool is built to operate in revolutions per minute, some means must then be available for converting surface speeds into revolutions per minute (RPM). Cut deep frozen confectionery at high speed with our unique SODEVA patented teeth or micro-teeth blades!

3 .1.1 identifying cutting equipment

Fig 1 Snack cutting equipment

Fig2 confectionery and snack cutting equipment

Fig 3 wafe cutting equipment

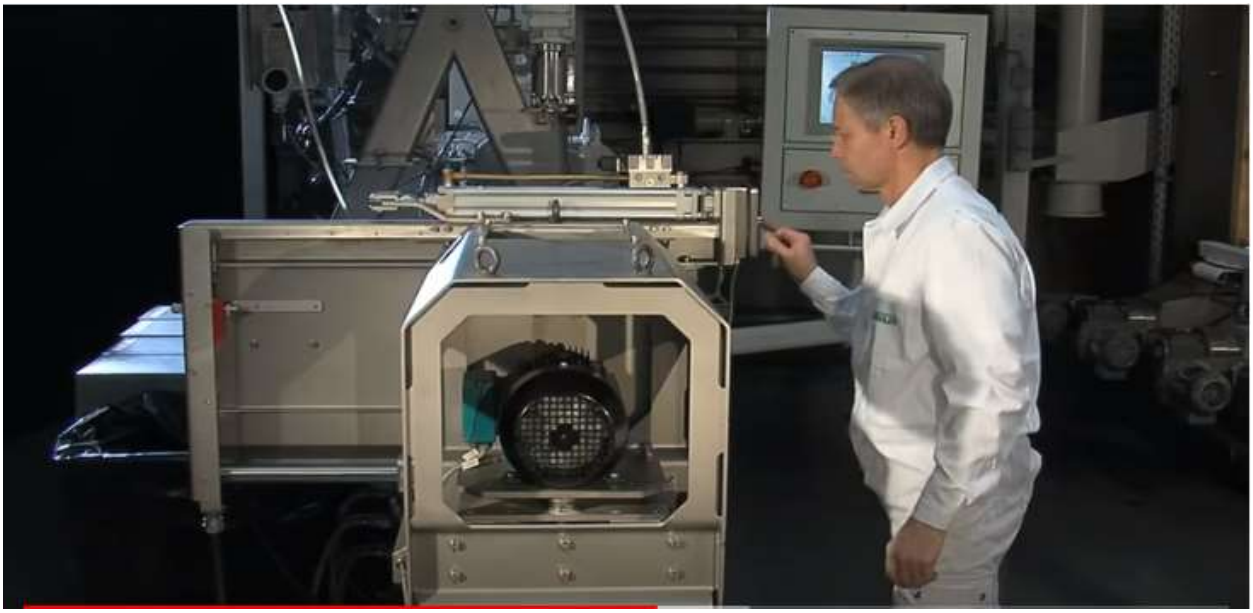

Fig 1 confectionery automated cutting equipment/extruder

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: Say true/false

1. Cutting tools are a primary consumable for all manufacturing processes (3point)

Test II: Choose the best answer

1. _____are a primary consumable for all manufacturing processes?(3points)

A. Cutting tools B. Cutting speed

C. All

Test III: Short answer

2. Write importance cutting tools (4points)

_____

_____

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

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

Information Sheet 4- Identifying and reporting variation in equipment maintenance operation

4.1 Identifying and reporting variation in equipment maintenance operation

4.1.1 Identifying variation in equipment maintenance operation

Five (5) types of equipment maintenance variation have been distinguished, which are differentiated by the nature of the tasks that they include:

- Corrective maintenance: The set of tasks is destined to correct the defects to be found in the different equipment and that are communicated to the maintenance department by users of the same equipment.
- Preventive Maintenance: Its mission is to maintain a level of certain service on equipment, programming the interventions of their vulnerabilities in the most opportune time. It is used to be a systematic character, that is, the equipment is inspected even if it has not given any symptoms of having a problem.
- Predictive Maintenance: It pursues constantly know and report the status and operational capacity of the installations by knowing the values of certain variables, which represent such state and operational ability. To apply this maintenance, it is necessary to identify physical variables (temperature, vibration, power consumption, etc.). Which variation is indicative of problems that may be appearing on the equipment This maintenance it is the most technical, since it requires advanced technical resources, and at times of strong mathematical, physical and / or technical knowledge.
- Zero Hours Maintenance (Overhaul): The set of tasks whose goal is to review the equipment at scheduled intervals before appearing any failure, either when the reliability of the equipment has decreased considerably so it is risky to make forecasts of production capacity . This review is based on leaving the equipment to zero hours of operation, that is, as if the equipment were new. These reviews will replace or repair all items subject to wear. The aim is to ensure, with high probability, a good working time fixed in advance.

- Periodic maintenance (Time Based Maintenance TBM): the basic maintenance of equipment made by the users of it. It consists of a series of elementary tasks (data collections, visual inspections, cleaning, lubrication, retightening screws,…) for which no extensive training is necessary, but perhaps only a brief training. This type of maintenance is the based on TPM (Total Productive Maintenance).

❖ In order to prevent/identify personal accidental injury:-

- Safety shields shall be installed on the transmission parts of all machines
- Safety doors shall be provided when the products are removed from the extruder
- The heating zone of the machine shall have safety and thermal insulation cover
- The cutter shall prevent the steel from falling in and prevent the operators hand is extended into the internal protection device
- Emergency brake buttons and alarms shall be installed at key parts of the equipment
- Hydraulic pressure tests shall be carried out regularly for all pressure vessels.

Fig 1 Identifying equipment maintenance variation

4.1.2 Reporting variation in equipment maintenance operation

The cost of regular maintenance is very small when it is compared to the cost of a major breakdown at which time there is no production. The main purpose of regular maintenance is to ensure that all equipment required for production is operating at 100% efficiency at all times.

The final component of reporting the defect is sharing the experience. This involves

- discussing the problem and solution with other members of the operations and quality control staffs through one-on-one discussions
- group discussions
- written communications, or

- formal training sessions so that each team member gains the experience of defect recognition
- solution determination
- Implementation for as many situations as possible.

To maintain this equipment is necessary to use predictive maintenance techniques that allow us to know the status of the equipment when is working, and scheduled shutdowns, which supposes a complete overhaul, with a frequency usually annually or higher.

The primary goal of an equipment maintenance operation and repair system is to eliminate or to avoid unnecessary or unplanned equipment downtime due to failure.

❖ Routine maintenance refers to any maintenance task that is done on a planned and ongoing basis to identify and prevent problems before they result in equipment failure. Some common routine maintenance includes regular inspections or service work. Routine maintenance tasks are usually fairly straightforward.

A standard maintenance procedure is a detailed list of steps that describes how to perform a maintenance task and is also a documented standard to which the job or task should be performed.

❖ Proactive types of maintenance:-

- Preventive maintenance.
- Predictive maintenance.
- Condition-based maintenance.
- Scheduled maintenance.
- Planned maintenance.
- Routine maintenance.
- Emergency maintenance.
- Corrective maintenance.

❖ The basic types of proactive maintenance falling under MRO include:

- Preventive maintenance, also known as PM.
- Corrective maintenance, where equipment is repaired or replaced after wear, malfunctions or breaks down.

❖ The principle of maintenance

Maintenance is regularly planned and performed on a piece of equipment while the equipment is still working so that it does not break down unexpectedly. By minimizing unexpected breakdowns, unplanned downtime is avoided and equipment and asset up-time can be maximized

❖ Some of the equipment subjected to this type of maintenance include:-

- Equipment and devices under pressure
- Installation of High and Medium Voltage
- Cooling Towers
- Certain lifts: service or people
- Vehicles
- Fire Prevention Facilities
- Storage tanks of certain chemicals

Procedures of maintenance

1. Follow a Regular Cleaning Schedule. Above all else, the most important confectionery equipment maintenance tip is to clean your machines regularly.
2. Clean with the Right Products.
3. Perform Preventive Maintenance.
4. Stock Up on Spare Parts.
5. Follow Manufacturer Usage Instructions.

Format for report damages or defects

Safety and durability of tools & equipment is very important. To check its workability and condition fill up a standard form required by your institution and submit to your facilitator or personnel in-charge of the maintenance for immediate repair or disposal.

Table.1 maintenance check list automated cutter

	Tool	Yes	No	Remark
1	Are tools in safe condition?			
2	Are instruction manuals available?			
3	Are power tools properly grounded?			
4	Are guards and shields in place?			
5	Is Personal Protective Equipment available?			
6	Are tools properly stored?			

Fig 2 Identifying and reporting equipment maintenance operation

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: Say true/false

1. The main purpose of regular maintenance is to ensure that all equipment required for production is operating (3point)

Test II: Choose the best answer

1. Which one of the proactive types of maintenance? (3points)

   A. Preventive maintenance B. Predictive maintenance.

   C. Routine maintenance D. All

Test III: Short answer

2. Write primary goal of equipment maintenance (4points)

_____

_____

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

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

Information Sheet 5- Monitoring quality and accuracy of cuts (product, paper)

5.1 Monitoring quality and accuracy of cuts (product, paper)

5.1.1 Monitoring quality of cuts (product, paper)

Monitoring quality of cutting tool state monitoring of the machining process has an important role in avoiding to long idle time of the machine or preventing undesired events like loss of accuracy, excessive tool wear or even the failure of the cutting tool. Routine monitoring tasks; for example, visually detects missing and broken tools as well as chatter from the characteristic sound it generates.

Two major problems in the field of metal cutting are tool wear and tool breakage, causing frequent downtimes. Tool breakage is a major cause of unscheduled stoppage in a machining environment, and is costly not only in terms of time lost, but also in terms of capital destroyed.

5.1.2 Methods of monitoring quality cuts (product, paper)

- Monitor Paper quality and increase process and product manufacturing through product state based data and utilizing a combination of Cluster Analysis
- Supervised Machine cuts.
- Describe Individual product in a structured way along the manufacturing program.
- Derive product state data, which is reflecting the increasing complexity of modern manufacturing programs.
- check equipment quality for product cut Check the equipment/ cut quality visual
- monitor quality of cuts buy quality measurement
- Cut quality (product, paper)

Fig 1 Quality of cuts (product, paper)

5.1.2 Monitoring accuracy of cuts (product, paper)

The monitoring of gradual wear requires the development of sensitive, accurate, and reliable devices. On-line monitoring and compensation of the tool wear would be of a great help to avoid the increase in cutting force loss of accuracy, deterioration in surface finish, increase in cutting temperature and increase in vibration due to tool wear.

5.2.1 Methods of monitoring accuracy cuts (product, paper)

- Evaluate method for both work piece materials by dividing the sample set corresponding to the two materials into training samples and
- Test samples according to the different cutting depths and feed rates.
- Check the equipment adjustment
- Clean the equipment properly
- Prepare cutting equipment
- Cut accurately the product/paper.

Process monitoring is the manipulation of sensor measurements (e.g., force, vision, temperature) in determining the state of the processes.

Fig 1 Accuracy of cuts (product, paper)

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: Say true/false

1. Process monitoring is the manipulation of sensor measurements (3point)

Test II: Choose the best answer

1. Which one of the following examples of routine monitoring tasks? (3points)

A. Visually detects missing B. broken tools

C. All

Test III: Short answer

2. Write at least two examples of routine monitoring tasks (4points)

_____

_____

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

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

Information Sheet 6- Identifying, rectifying and/or reporting out-of-specification outcomes

6.1 Identifying, rectifying and/or reporting out-of-specification outcomes

6.1.1 Identifying out-of-specification outcomes

The term OOS (out of specification), is defined as those results of in process or finished product/automated machine testing, which falling out of specified limits, that are mentioned in compendia, drug master file, or drug application. So, the OOS result occurrences have to be investigated and addressed.

Methods of identifying out-of-specification outcomes flow diagram

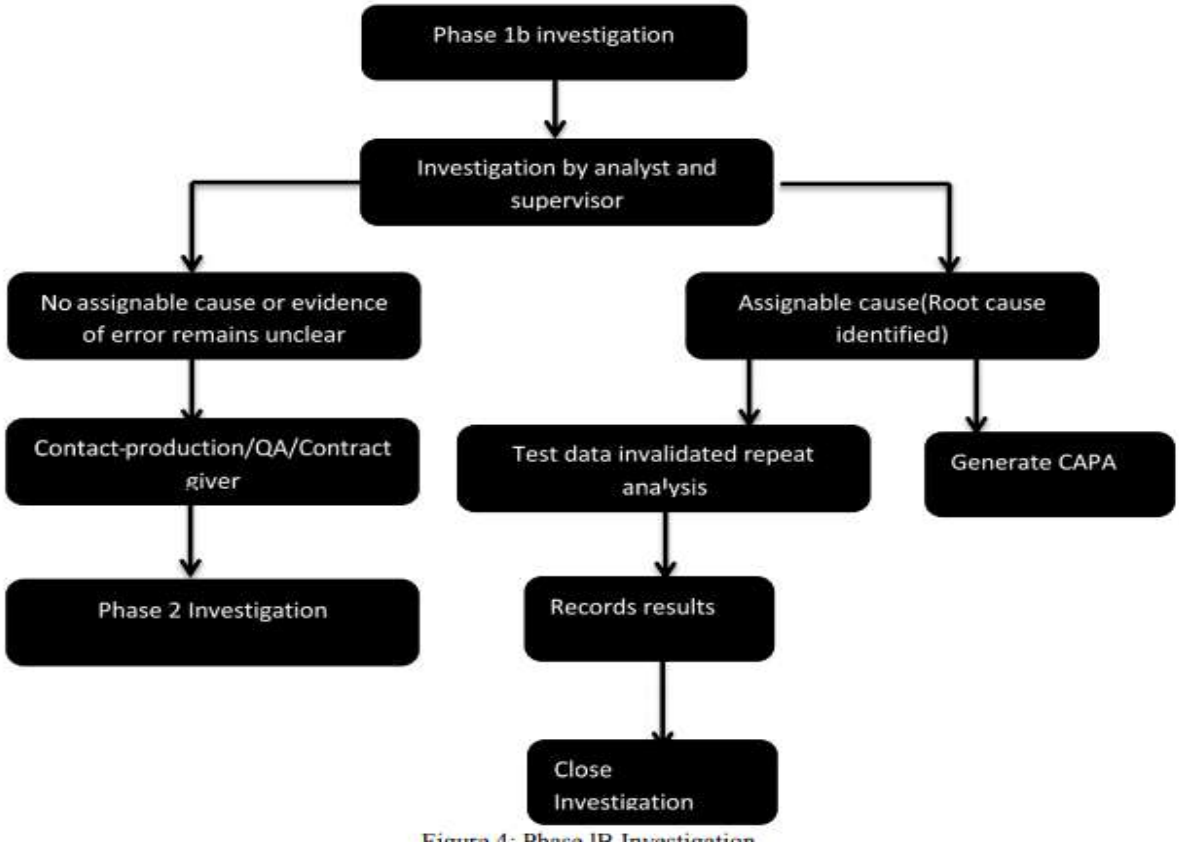

Figure 4: Phase IB Investigation

6.1.2 Rectifying out-of-specification outcomes

OOS results may indicate a flaw in product or process design. For example, a lack of robustness in product formulation, inadequate raw material characterization or control, substantial variation introduced by one or more unit operations of the manufacturing process, or a combination of these factors can be the cause of inconsistent product quality. In such cases, it is essential that redesign of the product or process be undertaken to ensure reproducible product quality. The specifications of product have their own specification. Identifying and rectifying the processes and the products outcomes take place throughout the process and take actions when they occur, the processes or products will be out-of-specifications.

6.1.3 Reporting out-of-specification outcomes

The reasons for OOS can be classified as assignable and non-assignable. When the limits are not in specified limits is called out of specifications. When OOS has occurred, the analyst should inform to QC manager. Then the senior manager will ask QA for issuing OOS form to analyst. The designated personnel will classify the OOS as either assignable cause or non-assignable cause and report to the supervisor.

The final component of reporting the defect is sharing the experience. This involves

- discussing the problem and solution with other members of the operations and quality control staffs through one-on-one discussions
- group discussions
- written communications, or
- formal training sessions so that each team member gains the experience of defect recognition
- solution determination
- Implementation for as many situations as possible.

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

1. The reasons for OOS can be classified as assignable and non-assignable (5point)

Test II: Short answer

1. What is the term out of specification mean (5point)

_____
_____

Note: Satisfactory rating ≥ 5 points Unsatisfactory - below 5 points
You can ask you teacher for the copy of the correct answers

Information Sheet 7-	Conducting the work

7.1 Conducting the work

Work conduct is the way of managing and handling the work it is the policy of well to maintain a safe, productive working environment free from sexual harassment, inappropriate and other disruptive behavior. Personal conduct that interferes with the operations, creates safety hazards, brings discredit to the fellowship or is offensive to members or fellow employees will not be tolerated.

Any work has conducted according to workplace procedure. Following workplace procedure has a contribution to maintain the quality the processed food. The work of monitoring quality of work outcome has its own parameters.

Fig1 Conducting the work

Conduct that has the purpose or effect of substantially interfering with an individual's work performance or creates an intimidating, hostile or offensive working environment, whether committed by supervisors/ non-supervisory staff, is also prohibited. Such conduct includes:-

- Sexual flirtations, touching, advances, or propositions.

- Verbal abuse of a sexual nature.

- Graphic or suggestive comments about an individual's dress or body.
- Sexually degrading words to describe an individual; and
- The display in the work place of sexually suggestive objects or pictures, including nude photographs.

Implementing a code of conduct in the workplace involves communicating the policies and guidelines to all staff and providing any necessary training to ensure they understand the code. The code should be practiced and promoted by management to lead the way for staff

For example, conduct at work include:-

1. Punctuality Power.
2. Keep it positive.
3. Dress for the job You Want.
4. Lend a hand.
5. Listen up.
6. Give up on gossip.
7. Learn from your mistakes.
8. Stay in control.

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 II: Say true/false

1. Work conduct is the way of managing and handling the work it is the policy (3point)

Test I: Choose the best answer

1. Which one of the following true about conducts yourself at work? (5point)
   A. Punctuality Power
   B. Keep it positive
   C. Learn from your mistakes
   D. All

Test III: Short answer

1. Write at least three conduct you at work (5point)

_____

_____

_____

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

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

Information Sheet 8-	Maintaining the work area automated machine

8.1 Maintaining the work area of automated machine

Maintaining a clean workplace **automated machine** is vital for employers to reduce their workers compensation claims and keep efficiency high. When employees work in a messy environment, they may not notice all hazards, which increase the risk of an accident. 5S was derived from the Japanese words seiri, seiton, seiso, seiketsu, and shitsuke. 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.

Housekeeping order is "maintained" not "achieved." Cleaning automated environment and machine/workplace organization must be done regularly, not just at the end of the shift. Integrating housekeeping into jobs can help ensure this is done.

Method of housekeeping procedure

- Open bathroom ventilation.
- Sweep the bathroom floor.
- Scrub and finish the platform, bathtub, and basin.
- Scrub and finish the toilet bowl, rim, ring, and hinge.
- Wipe the mirror.
- Clean bathroom walls using wet mop or sponge.

❖ 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

Fig 1 maintaining the work area

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

❖ Effective housekeeping results includes:-

- 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, vapors)
- 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)

Only allow responsible person, who are familiar with the instructions, to operate

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 I: Say true/false

1. Housekeeping order is "maintained" not "achieved (3point**)**

Test II: Choose the best answer

2. What are the benefits of good housekeeping practices? (5point)

A. Tripping over loose objects on floors, stairs and platforms

A. being hit by falling objects

B. slipping on greasy, wet or dirty surfaces

C. All

Test III: Short answer

1. Write at least three effective housekeeping results (5point)

_____
_____
_____

Note: Satisfactory rating ≥ 5 points Unsatisfactory - below 5 points
You can ask you teacher for the copy of the correct answers

9.1 Maintaining workplace records

Records management concerns more of the day-to-day activities involving physical or digital files, like capturing, storing, modifying, or sharing them**.**

❖ Workplace information may include to:-

- standard operating procedures (SOPs)
- specifications
- production schedules and instructions
- manufacturers' advice

❖ Records management has several goals:

- Organizing existing and future documents
- Improving workflow
- Allowing quick search and retrieval of documents
- Maintaining organization of files to reduce the number of lost and misfiled documents
- standard forms and reports

Fig1 workplace record

❖ Analysis of these records can identify:-

- common problems by model
- spare parts most frequently used by model
- maintenance activities performed in a month by administrative area
- service histories of individual devices
- equipment operator training needs and
- Cost–effectiveness of equipment maintenance and repair services.

Fig 2 workplace record

Methods of record mentening work

- Use notecards or a notebook to record the information.
- Print out the information you find and then
- Take notes on notecards or in a notebook.
- Find it easier to remember information if you have written it down yourself.
- Document each source as you work

Self-Check 9	Written Test

Name…… ID…… Date…….

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

Test I: Say true/false

1. Workplace records are an important part of any work environment (3point)

Test II: Choose the best answer

1. Why are records essential? (3points)

A. For continuous monitoring of quality system B. To identify failures in equipment

C. To revisits information; reference D. All

Test III: Short answer

1. Write five types of records (4points)

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

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

Operation sheet - 2	Operating cutting processes of automated machine

Procedure

Step 1: Apply safety rules of laboratory/ industry (PPE)

Step 2: Prepare equipment's which is used for cutting operation and put in operating area.

Step 3: Check cutting machine operating condition/ functionality

Step 4: Check the cutting machine breaker line/operation process line before processing

Step 5: Disinfect cutting equipment by using recommended detergent

Step 6: Read automated cutting manuals before starting operating cutting processes

Step 7: Operate cutting processes

LAP TEST	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task-1 Operate cutting processes of automated machine

LG #59	LO3. Shut down the automated cutting process

Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Identifying shut down procedures • Shutting down process according to workplace procedures. • Identifying and reporting maintenance requirements according to workplace 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 shut down procedures • Shut down process according to workplace procedures. • Identify and report maintenance requirements according to workplace requirements
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 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test”

Information Sheet 1-	Identifying shut down procedures

1.1 Identifying shut down procedures

Shutting down procedure is a process of factory machine; a termination/suspension of operation, services is turn off or stop. Shutdown includes steps to render the systems safe, such as removal of hazardous process materials and inert (asphyxiating) gases. The systems might be cleaned as part of the shutdown; Plant shutdown, or turn around, is a temporary closure of a building to perform maintenance.

- ❖ Shut down procedures
  - Prepare checking equipment and testing materials
  - cleaning (in some cases cleaning may be carried out by a dedicated cleaning crew)
  - Follow steps that are stated in the work place
  - Shutdown the machine from simple to complex

❖ Reading, interpreting and following information on written job instructions, specifications and other applicable machine reference documents

- Checking and clarifying task-related information
- Entering information onto preforms and standard workplace forms
- Shutting down machine/equipment
- Purging/de p energizing equipment
- Installing safety/security lock-off devices and signage

❖ The agenda items for machine production coordination meeting include:

- Safety first
- Lock out Tag out procedures
- Standard operating procedures
- What systems are to be secured and by whom
- How systems will be secured and by whom
- Why will the systems be isolated or shut down

- Who are the contact persons on the job site in case something goes wrong
- Action plan in the event something goes wronged back up materials on site
- How long is the duration of the shutdown
- Confirm when the shutdown will occur

❖ Shut down procedure :

- Undertake shut-down sequence safely and to standard operating procedures.
- Depressor /empty/de-energy/bled machine/equipment to standard operating procedures.
- Verify safe shut-down of machine/equipment.
- Install safety/security lock-off devices and signage to standard operating procedures.
- Do not start a miller until the bowl is locked in place and the attachments are securely fastened.
- Turn off motor before you scrape down the sides of the bowl, when using a miller.
- Left machine/equipment in clean and safe stat
- Make sure they cannot fall, when working with tools at height

Fig1 Shut down procedures

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: Say true/false

1. Cleaning may be carried out by a dedicated cleaning crew (5point).

Test II: Choose the best answer

1. List shutdown procedures (5point).

_____

_____

_____

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

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

Information Sheet 2-	Shutting down process

2.1 Shutting down process according to workplace procedures.

Shutdown Process is shutdown of all process system. Process Shutdown is activated automatically by various process sensors. Process Shutdown will shut down and isolate all related process equipment or systems, to limit the probability of an abnormal operating condition leading to emergency situation. Automated machine shutdowns in process industries typically happen in frequently (every year/ two) and take several days to complete.

In general, these shutdowns should have two objectives:

1. To repair problems identified during previous major shutdowns, and
2. To inspect parts of the plant not accessible during operation in order to identify problems that will be repaired during future planned shutdowns

Many processors have their own procedure for starting up and shutting down an automated machine or injection molding machine and, depending on the process, there may be reasons for the specific method.

Some examples of shutdown objectives are:-

- Zero harm to shut down workforce
- Emergent work to be restricted to 10% of planned work
- Shutdown costs to be within budgeted costs
- Shutdown overrun to be less than 5%

Shutdown process of automated machine

Step 1 Make sure power tools are properly grounded or are double insulated

Step 2 Switch off cutting equipment and unplug power tools before changing blades or servicing and repairing

Step 3 Wear appropriate personal protective equipment (PPE), such as glasses, goggles, dust masks, face shields, hearing protection, etc.

Step 4 Keep by standers at a safe distance

Step 5 Keep all guards and shields in place

Step6 Unplug and store tools after use

Step 7 Consider keeping power tools locked up to prevent unauthorized use

Step 8 cleaning and other activities by turning off cutting equipment by unplugging a power or by pressing emergency button.

Fig 1 Shutting down process

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: Say true/false

1. Process Shutdown is shutdown of all process system (3point).

Test II: Short answer

1. What are the key issues which must be addressed during the shutdown initiation phase (3point?)

A. Shutdown date
B. Shutdown duration
C. Overall Shutdown budget
D. All

Test III: Short answer

1. Write two objectives of shutdown process (4point)

_____

_____

_____

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

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

Information Sheet 3- Identifying and reporting maintenance requirements according to workplace requirements

3.1 Identifying and reporting maintenance requirements

3.1.1 Identifying maintenance requirements

Maintenance refers to planned technical activities or activities carried out in response to a breakdown, to ensure that assets are functioning effectively, and require skills, tools and spare parts

When working with equipment and machinery (maintenance personnel), observe the following rules:

- Ensure that it cannot be started or operated by either disconnecting the means of starting or by isolation at the panel and/or the local stop.
- Always use the correct tools for the job.
- Before Keep chisels in good condition.
- Use the correct grade of protective visors or goggles.
- Do not manhandle heavy objects. Use lifting gear.
- Always replace belt guards and other safety shields.
- Always read the carefully instructions carrying out any maintenance operation on specialized equipment
- Test turbidity of effluent on a regular basis and whenever the water quality or flow rate changes.

❖ Preventative maintenance and operating procedures that are necessary to ensure Satisfactory operation.

The following preventative maintenance and operating procedures includes:-

- Corrective or breakdown maintenance: this is carried out when components Fail and stop working.

- Preventive maintenance: this is a regular, planned activity that takes place so that breakdowns are avoided. Examples of preventive maintenance would include servicing of equipment, inspecting equipment for wear and tear and replacing as necessary, cleaning and greasing moving parts of equipment, and replacing items that have a limited lifespan.

Maintenance plan in automated cutting machine processing includes:-

- maintenance activities and schedules
- maintenance costs and budget details
- Staff resource and supply requirements
- staff roles and responsibilities
- contingency plan for staff and supply problems
- reporting requirements
- hazard and risk control measures
- OHS procedures, personal protective clothing and equipment requirements

Environmental impact control measures.

3.1.2 Reporting maintenance requirements according to workplace Requirements

The main problem areas of automated cutting machine are related to:-

- Poor design.
- Variations in raw water quality.
- Lack of maintenance.
- inadequately trained operators,
- inadequate process monitoring,
- poor record-keeping and poor management

Reporting

Format for report damages or defects

Safety and durability of tools & equipment is very important. To check its workability and condition fill up a standard form required by your institution and submit to your facilitator or personnel in-charge of the maintenance for immediate repair or disposal.

Table.2 maintenance schedule

Date	**Tool**	**Maintenance check points**	**Signature**	**Maintenance required**	**Signature**
10/2/2013	Automated cutting machine	Cutter		cutter	
Maintenance Performed				Date	**Signature**
Automated cutting machine					

Table.1 maintenance check list of cutting machine

	Tool	Yes	No	Remark
1	Are tools in safe condition?			
2	Are instruction manuals available?			
3	Are power tools properly grounded?			
4	Are guards and shields in place?			
5	Is Personal Protective Equipment available?			
6	Are tools properly stored?			

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: Say true/false

1**.** Preventative maintenance and operating procedures that is necessary to ensure Satisfactory operation (3point)

Test II: Choose the best answer

1 The main problem areas of maintenance (3point)

A. poor design,

B. Variations in raw water quality.

C. lack of maintenance,

D. All

Test III: Short answer

1. List the main problem areas of maintenance (4point?)

_____

_____

_____

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

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

Operation sheet - 2	Shutting down process of automated machine

Procedure:

Step 1: Check electric line breaker by testing voltmeter for our safety if it's a problem happen maintain before cleaning.

Step 2. Clean internal and external part of automated cutting machine by recommended detergent.

Step 3: Cover automated cutting machine by plastic/other materials.

Step 4: Shutdown all lines of automated cutting machine breaker from simple to complex

LAP Test 1	Performance Test

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it.

Task1: Shutting down process of automated cutting machine

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