

Ginning and Spinning Operation

Level – I

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Acronym

PPE: -personal protective equipment

WHS: -Work health and safety

SOPs: -follow standard operating procedures

LAP: - Laboratory aptitude performance

Introduction to the Module

Textile manufacturing is a major industry. It is based in the conversion of different types of fiber in to yarn, then fabric, then textiles. These are then fabricated in to clothes or other application. Cotton remains the most important natural fiber, so is treated in depth. There are many variable processes available at the spinning and fabric-forming stages coupled with the complexities of the finishing and colorations processes to the production of wide ranges of products. There remains a large industry that uses hand techniques to achieve the same results.

This module is designed to meet the industry requirement under the ginning and spinning occupational standard, particularly for the unit of competency: **produce simple textile product**.

This module covers the units:

- Planning for product production
- Preparing for production
- Produce product using spinning machine
- Finishing production process

Learning Objective of the Module

- Identify product parameters and method of production
- Assess tools and equipment for ability to achieve plan
- Prepare required materials, tools and equipment.
- Produce product by using spinning wheel, manual reeling equipment, manual ginning machine
- Unload or removing product from equipment.
- Rectify product faults
- Assess product against plan.

Module Instruction

For effective use this modules trainee is expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” giver at the end of each unit and
5. Read the identified reference book for Examples and exercise

Unit one: Plan for Product Production

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

- Product parameters and method of production.
- Work health and safety (WHS) requirements
- Materials, tools and equipment.
- Pattern for production.
- Assessment of tools and equipment
- Identify additional resources.

This unit 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:

- Product parameters and method of production.
- Work health and safety (WHS) requirements
- Require materials, tools and equipment.
- Identify and review pattern for production.
- Assess tools and equipment for ability to achieve plan.
- Identify additional resources.

1.1. Product parameters and method of production.

1.1.1. Production planning

Production planning incorporates a multiplicity of production elements, ranging from the everyday activities of staff to the ability to realize accurate delivery times for the customer. With an effective production planning operation at its nucleus, any form of manufacturing process has the capability to exploit its full potential. Let us see what famous management gurus have to say about the function of planning and production planning in particular:

- Planning is deciding the best alternative among others to perform different managerial operations in order to achieve the predetermined goals.... Henri Fayol

- Planning is the determination in advance of line of action by which certain results are to be obtained.... Hart
- Planning is an intellectual process, the conscious determination of the course of action, the basing the decisions on purpose, facts and considered estimates.... Koontz and O'Donnell
- Planning is found mentally in a mental pre-disposition to do things in orderly way, to think before acting and to act in light of facts rather than of guesses..... Urwick

Production Planning and Control: A planned work brings success. Without planning nothing is completed within the required time. So planning has its own importance which is intolerable. “Planning” gives a scheduled task and ‘control’ completes it successfully. But production planning and control is not an easy task. Basic working procedure of production planning and control is given as follows

- Taking orders from marketing division.
- Analyzing the orders.
- Planning for ginning the raw fiber.
- Planning for spinning the yarn.
- Planning for reeling the hank.
- Planning for finishing the fabric.

1.1.2. Textile Manufacturing Chain

The textile manufacturing chain involves the following operations

- Production of fibers: - both natural (cotton, wool, silk, flax, hemp, etc.) and synthetic fibers (polyester, nylon, acrylic, polypropylene, etc.). Other manufactured fibers are produced from natural resources like viscose, modal, lyocell, etc. The textile and apparel industry of Bangladesh is predominantly cotton-based.
- Production of yarns: - cotton is processed into yarns through a ring/rotor spinning mechanism. Synthetic fibers are also processed into synthetic yarns through a melt/dry/wet spinning mechanism.
- Production of fabrics: - knitted and woven fabrics are mainly used for apparel production. The knitting and weaving industries process the two types of fabrics, knitted and woven, respectively.

- Wet processing: - this includes dyeing, printing, washing and finishing in any form fiber, yarn, fabric and garment
- Apparel manufacturing: - assembling finished fabrics into apparel through apparel manufacturing units, consisting of cutting, pattern making, sewing, and finishing.

Table 1:- Input and output in Textile manufacturing chain.

Process	Raw Material (Input)	End Product (Output)
Yarn manufacturing/Spinning	Fiber (cotton)	Yarn
Fabric manufacturing/Knitting and weaving	Yarn	Gray fabric
Wet processing/Dyeing, finishing, printing	Gray fabric	Finished fabric

1.1.3. Textile manufacturing and Production methods

Textile manufacturing is a major industry. It is based in the conversion of different types of fiber in to yarn, then fabric, then textiles. These are then fabricated in to clothes or other application. Cotton remains the most important natural fiber, so is treated in depth. There are many variable processes available at the spinning and fabric-forming stages coupled with the complexities of the finishing and colorations processes to the production of wide ranges of products. There remains a large industry that uses hand techniques to achieve the same results.

A. Preparatory processes for preparation of yarn

When the cotton comes out of a bale, it is all packed together and still contains vegetable matter. The bales broken open using a machine with large spikes. It is called an Opener. In order to fluff up the cotton and remove the vegetable matter, the cotton is sent through a picker, or similar machines. A picker looks similar to the carding machine and the cotton gin, but is slightly different. The cotton is fed into the machine and gets beaten with a beater bar, to loosen it up. It is fed through various rollers, which serve to remove the vegetable matter.

B. Spinning yarn manufacture

The spinning machines take the roving, thins it and twists it, creating yarn which it winds onto a bobbin. In mule spinning the roving is pulled off a bobbin and fed through some rollers, which are feeding at several different speeds. This thins the roving at a consistent rate. If the roving was not a consistent size, then this step could cause a break in the yarn, or could jam the machine. The yarn is twisted through the spinning of the bobbin as the carriage moves out, and is rolled onto a cop as the carriage returns. Mule spinning produces a finer thread than the less skilled ring spinning.

C. Fabric production method

Weaving is a textile production method which involves interlacing a set of vertical threads (called the warp) with a set of horizontal threads (called the weft). This is done on a machine known as a loom, of which there are a number of types. Some weaving is still done by hand, but the vast majority is mechanized.

Knitting and crocheting involve interlacing loops of yarn, which are formed either on a knitting needle or on a crochet hook, together in a line. The two processes are different in that knitting has several active loops at one time, on the knitting needle waiting to interlock with another loop, while crocheting never has more than one active loop on the needle.

Braiding or plaiting involves twisting threads together into cloth. Knotting involves tying threads together and is used in making macramé.

Non-woven or Lace is made by interlocking threads together independently, using a backing and any of the methods described above, to create a fine fabric with open holes in the work. Lace can be made by either hand or machine.

D. Finishing- processing of textiles

The grey cloth, woven cotton fabric in its loom-state, not only contains impurities, including warp size, but requires further treatment in order to develop its full textile potential. Furthermore, it may receive considerable added value by applying one or more finishing processes.

1.1.4. Product Parameter Of Textile Product

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Quality is of prime importance for every industry or business, to get increased sales and better name amongst Consumers & fellow Companies. Generally Quality control Standards for export are set strictly, as this business also holds the prestige of the country, whose company is doing the export. Quality standards like ASTM, AATCC, BS, DIN and JIS & ISO must be recognized and agreed by all levels of management. However quality expectations for exports are related to the type of customer segments and the retail outlets. For textile and apparel industry product quality is calculated in terms of quality and standard of fibers, yarns, fabric construction, colors fastness, Surface designs and the final finished garments products. The present paper was aimed at investigating the important testing parameters for the textile products and the steps to be taken to improve these product parameters.

Different product parameters:

A. Yarn count

Yarn count is a numerical expression which defines its fineness or coarseness. It is an important parameter of yarn. Higher count will be more thin yarn and course yarn low count. A characteristic measure to classify fibers and yarns is given by the linear density, which defines the mass of polymer per length of fiber or yarn. Different systems for linear densities are in use; their use depends on the material and region.



Fig 1. Different Yarn Count

B. Yarn twist

Twisting is a mechanism used to consolidate fibers into yarns and provide yarn strength. Yarn twist is typically described using two parameters: twist level and twist direction. Twist level is commonly expressed by the number of turns of twist per unit length. Another way to express twist level is by using the twist multiplier. In spun yarns, twist is necessary to maintain yarn

integrity and provide strength. The combination of twist level and twist direction represents a key parameter in the design of yarns or fabrics. Twist Testing:

Direction Twist:

- S –Twist: When Held in vertical position, the spiral confirm in slope to the central position of the letter ‘S’
- Z –Twist: When Held in vertical position, the spiral confirm in slope to the central position of the letter ‘Z’

No of Turns (Twists) per Unit length:

- Single Twist
- Double Twist
- Twist Multiplier

Apparatus: Twist Tester

Methods: Direct Method and Indirect Method



Fig 2. yarn twist

C. Lie number

Diameter strongly depends on how the filaments lie within the yarn. This is a property that depends on various factors (e.g. extend of twist, intermingling,) and can even change considerably in 1m of a yarn. Diameter can thus not really be captured in an mm indication due to high variance.

Instead, we measure multifilament's by their weight (e.g. dtex, which measures the weight of the yarn in grams per 10'000 meters). Taking into account the specific gravity of a material, you can derive a rough thickness indication.

Diameter example of a multifilament yarn with 10 filaments

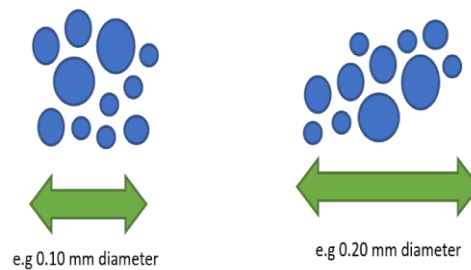


Fig 3. lie number

1.2. Work health and safety (WHS) requirements

The textile industry consists of a number of units engaged in spinning, weaving, dyeing, printing, finishing and a number of other processes that are required to convert fiber into a finished fabric or garment. There are several safety and health issues associated with the textile industry.

The major safety and health issues in the textile industry can be stated as under:

A. Exposure to cotton dust

The workers engaged in the processing and spinning of cotton are exposed to significant amounts of cotton dust. They are also exposed to particles of pesticides and soil. Exposure to cotton dust and other particles leads to respiratory disorders among the textile workers. The fatal disease of byssinosis, commonly known as brown lung, is caused among people working in the textile industry on account of excessive exposure to cotton dust. The symptoms of this disease include tightening of the chest, coughing, wheezing and shortness of breath.

Hence the Occupational Safety and Health Administration i.e. OSHA made it compulsory for employers in the textile industry to protect their workers from over exposure to cotton dust and its evil effects. The OSHA determined certain guidelines which are applicable to all private employers in the textile industry.

B. Exposure to noise

High levels of noise have been observed in most of the units engaged in the textile industry, particularly those in developing countries. In the long run, exposure to high noise levels has been

known to damage the eardrum and cause hearing loss. Other problems like fatigue, absenteeism, annoyance, anxiety, reduction in efficiency, changes in pulse rate and blood pressure as well as sleep disorders have also been noted on account of continuous exposure to noise. Lack of efficient maintenance of machinery is one of the major reasons behind the noise pollution in a majority of the units. Though it causes serious health effects, exposure to noise is often ignored by textile units because its effects are not immediately visible and there is an absence of pain.

C. Ergonomic issues

Ergonomic issues are observed in a majority of the units engaged in textile-related activities in India. Most of these units have a working environment that is unsafe and unhealthy for the workers. Workers in these units face a number of problems such as unsuitable furniture, improper ventilation and lighting, and lack of efficient safety measures in case of emergencies. The workers in such units are at risk for developing various occupational diseases. Musculoskeletal disorders like carpal tunnel syndrome, forearm tendinitis, bicapital tendinitis, lower back pain, epicondylitis, neck pain, shoulder pain, and osteoarthritis of the knees are some of the occupational diseases that have been observed among the workers on account of poor ergonomic conditions. These issues are more common in developing nations as compared to developed ones.

Apart from this, lack of efficient measures for the safety of the workers was also observed. Lack of essential items such as first aid kits, fire extinguishers, and alarms was noted in most of the units. This puts the workers under great risk in times of an emergency. Protective equipment's like metallic gloves were not provided to the workers in several units for protection against potential accidents and injuries.

Generally, Safety and health measures play an important role in any industry. It is essential that the workers be aware of the various occupational hazards in the industry. At the same time, it is necessary that the management take the necessary steps to protect workers from potential hazardous situations.

The following suggestions can be made to improve the safety and health conditions in spinning units:

- The seats of the workers and the tables should be well aligned in height so that there is no musculoskeletal strain.
- There should be proper lighting at the place of work so that eye strain can be avoided.
- Machinery should be well maintained in order to reduce the level of noise. If necessary, certain parts of machines can be replaced.
- In case the noise level cannot be controlled, workers should be provided with earplugs so that exposure to noise can be reduced.
- Workers can be rotated within jobs so that they are not faced with continuous noise exposure for a long period of time.
- There should be proper ventilation at the place of work.
- In order to reduce the exposure to dust, workers should be provided with masks.
- Trained medical personnel and first aid facilities as well as safety equipment's such as fire extinguishers and fire alarms should be available at the place of work.
- In units where there is heavy exposure to dangerous chemicals, workers should be provided with safety gloves.
- Proper dust control equipment should be set up and maintained to reduce the workers exposure to cotton dust.
- Medical examinations should be conducted by the employers for the workers from time to time. If significant occupational health problems are observed, appropriate measures should be taken by the management.

1.3. Require materials, tools and equipment.

1.3.1. Textile Materials

Textiles can be made from many materials. These materials come from four main sources:

- Animal (wool, silk)
- plant (cotton, flax, jute)
- mineral (asbestos, glass fiber) and
- Synthetic (nylon, polyester, acrylic).

In the past, all textiles were made from natural fibers, including plant, animal, and mineral sources. A textile or cloth is a flexible woven material consisting of a network of natural or artificial fibers often referred to as thread or yarn.

Yarn is produced by spinning raw fibers of wool, flax, cotton, or other material to produce long strands. Natural fabrics are derived from the fibers of animal coats, plant seeds, stems and leaves, and silkworm cocoons.

They are soft and breathable and UV light does not cause discoloration. Coir is a natural fabric which is obtained from the fibrous husk of a coconut. It is stress resistant, bio-degradable and buoyant. Coir is used to make sacking, twine, doormats and items such as bags and ropes. Coir can also be used in construction and to improve clays. It is a good fabric to control soil erosion. Cotton is one of the best-known natural fabrics.

The fiber grows around the seeds of the cotton plant. Cotton is soft, strong, flame retardant, hypo-allergenic and easy to wash. It is the most popular natural fabric used in making clothing. It is also used to make home furniture, bags and medical products. Heavyweight cotton fabric can be used to make items such as shoes and tents.

1.3.2. Tools and equipment

Textile plants operate with the use of a wide range of machinery and equipment that make it possible to create, refine, and package the goods produced

A. Spinning wheel

The basic spinning of yarn involves taking a clump of fibers and teasing a bit of them out, then twisting it into a basic string shape. The spinner continues pulling and twisting to make it longer and longer, and to control the thickness. Thousands of years ago, people began doing this onto a stick, called a spindle, which was a very lengthy process.

The actual wheel part of a spinning wheel does not take the place of the spindle, instead it automates the twisting process, allowing one to "twist" the thread without having to constantly do so manually, and also the size of the wheel lets one more finely control the amount of twist. The thread still ends up on a spindle, just as it did before the invention of the wheel.

The wheel itself was originally free-moving, spun by a hand or foot reaching out and turning it directly. Eventually, simple mechanisms were created that let a person simply push at a pedal and keep the wheel turning at an even more constant rate. This mechanism has been the main source of technological progress for the spinning wheel.



Fig 4. Spinning wheel

B. Reeling machine

Silk is the 'Queen of Textiles'. Despite the popularity of synthetic fabrics in recent years, silk continues to hold a unique place in the textile world, by virtue of its aesthetic appeal, luster, feel, suppleness combined with softness, resilience etc. Raw silk is formed by combining the required number of silk filaments drawn from individual cocoons. The raw silk quality varies according to the cocoon characters, resellers' skill as well as reeling appliances.

India is a traditional Seri cultural country and mainly multi volatile cocoons are produced for commercial exploitation. Therefore the traditional reeling systems like country charkha and cottage basin are still existing.

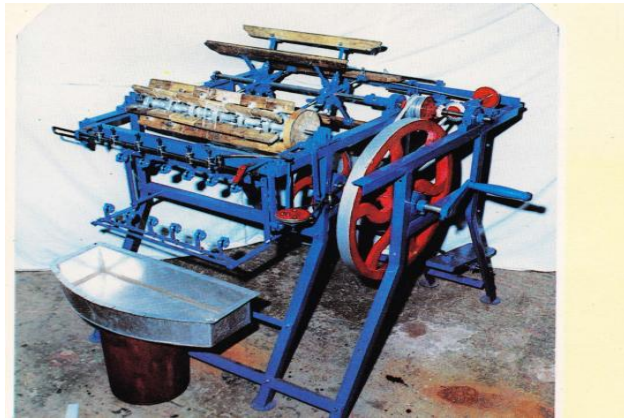


Fig 5. Manual Reeling Machine

Objective

- Improvement in raw silk quality.
- Improvement in working conditions of charkha operator.
- Suitability of the machine for reeling both inferior and superior quality cocoons.
- Economy in cost of machine and production of raw silk.
- Easy availability of the machine and its spares.
- Higher earnings for the operator per unit quantity of raw silk produced.

C. manual ginning machine

Simply to define ginning we can say that the process is used to get the cleaned cotton by separating or removing the seeds, dust or any other foreign particles. So that better cotton can be offered for the cotton spinning mills.

Objects of Ginning

- Make the fiber-free from seeds without gin-cut fiber.
- Ensure the best quality of cotton and get the fair price of cotton in the market.
- To be confident that fiber does not contain excess and unexpected seeds or any other particles.
- To make the spinning process easier and effective



Fig 6. Ginning Machine

1.4. Identify and review pattern for production.

The classification of textiles in describes in what way a textile pattern is created, and their different basic expressional possibilities, and is divided into the three areas:

- **Plain weaves:** A weave without decoration that could have different after treatments in structure, printed colors or embroidery.
- **Monotype pattern (direct pattern):** A way of making a decoration/pattern during weaving, craft, tapestry etc.
- **Repeated pattern:** A decoration/pattern that is prepared in advanced, for mechanical production, reports etc.

To get a more systematic overview of how to design with new textile materials, we build on work by adding new dimensions in the classification:

- **Reversible Dynamic pattern:** A textile pattern that reacts to environmental stimuli and always returns to a given initial expression. There is a starting point and x numbers of possible expressions.
- **Irreversible Dynamic pattern:** A textile patterns that changes during use and does not return to an initial expression, the expression is built up over time.

1.5. Assess tools and equipment for ability to achieve plan.

1.5.1. Apply OHS practices

- Use Equipment Properly

Always take the proper precautions when operating machinery or using tools. Taking shortcuts is a leading cause of workplace injuries. Use the appropriate tool for the job, and use it in the right way. When using tools and machinery, put safety first with the following tips:

- ✓ Only use machinery you are trained and authorized to use.
- ✓ Keep tools clean and in good working order.
- ✓ Organize tools and always return them to their proper place.
- ✓ Only perform tasks you have been properly trained to perform.
- ✓ Never leave machinery unattended while it is running.
- ✓ Always obey operating instructions.
- ✓ If something seems wrong, immediately stop the machine and get assistance.
- ✓ Communicate with those around you.
- ✓ Read and follow all labels and instructions.
- ✓ Wear appropriate and compact clothing; loose, billowing clothing and accessories can easily get caught in moving parts.

- **Locate Emergency Exits**

Always know where emergency exits are located and keep the path to them clear. You should also have clear access to emergency shutoffs on machinery.

- **Report Safety Concerns**

If you notice a potential safety hazard or risk, report it to your supervisor immediately so they can address the situation. Keep communication lines open and work as a team to create a safe working environment.

1.5.2. Adjust The Machine (Equipment)

Adjustments are an ordinary part of daily work routines and if they are handled properly, can result in higher rates of productivity and efficiency.

The problem is that many equipment adjustments happen at inappropriate times or without the consent of management. Shift changes and other workplace events inevitably lead to adjustments by individual operators and can lead to a disruption of production standards.

It helps to create a system that minimizes unnecessary adjustments and facilitates adjustments that can be quickly repeated time after time. In addition to regular inspections, owners and

managers should identify standards for adjustments that occur at specific points in the manufacturing process including the following equipment adjustment events.

- **Reconfiguration.** It's common for manufacturing equipment to be resized and reconfigured to accommodate changes in the manufacturing process. However, it's important to make sure that reconfigurations are done to accommodate system wide process modifications rather than personal operator preferences.
- **Machine wear.** Time takes its toll on manufacturing equipment. With each passing day, the equipment you rely on for production is getting a little bit older - and a little less capable of meeting your production standards. Equipment adjustments can compensate for age, as long as they are performed in accordance with the manufacturer's guidelines.
- **Installation.** For most pieces of manufacturing equipment, the installation process consists of a series of adjustments that are necessary to bring the machine into peak working order. These adjustments are often highly technical and done with the assistance of the machine's manufacturer reps - not necessarily by the person who will ultimately be responsible for operating the equipment.
- **Customer specifications.** Some companies routinely adjust their machines to accommodate specific client requests. That shouldn't be a problem unless you fail to accurately document the equipment's standard setting or customer specs for future orders.
- **Change in use.** Another common practice is for manufacturers to use the same piece of equipment to produce multiple products. When the product changes, the equipment needs to be adjusted according to pre-determined standard settings that have been carefully documented by managers and operators.

1.5.3. Check the machine all part and tools

- **Setting:** Setting is the activities to set or install the machine parts or required ancillaries. Adjustment also complementary word to setting used for appropriate setting.
- **Checking:** Checking means investigation of machine condition. It is very important work in case of maintenance. It is very skilled depends work as successful maintenance that depends on correct fault detection.

- **Repairing:** Repairing or altering of spares and equipment (if necessary) is to be detected and necessary measures are taken (repairing altering setting adjustment).
- **Overhauling:** It is the work of maintenance, but not frequent or schedule work. It is done as per as necessary.

1.5.4. Maintain the machine

System of Maintenance: Basically there exist 2 systems on which based different types of maintenance are done. They are:

1. Break down maintenance
2. Planned maintenance.

Types of Maintenance:

1. Preventive maintenance.
2. Productive maintenance.
3. Routine schedule maintenance (Cleaning, checking, lubricating).
4. Remedial maintenance.
5. Restorative maintenance emergency maintenance.

1.6. Identify Additional Resources.

Resource planning consists of three stages. They are:

- Identification and inventory of resources. ’
- Evolving a planning structure with appropriate technology, skill and institutional set-up for implementing resource development plans.
- Matching the resource development plans with overall plans

It’s better to plan your resource needs in advance. There is too much risk involved with waiting until you need a particular resource and then trying to book them. That person might be already fully committed on another project, or on vacation or so on.

This exercise of booking resources in advance is part of capacity planning. It’s essential to make sure that you have a solid flow of work through the organization. Capacity planning means that your resources have enough to do at all times. No one is waiting for work to come in, and everyone knows what the next quarter’s commitments will be. Planning in advance for your

project helps your client have confidence that the project will take the length of time you've said, and helps the business manage the throughput of assignments.

Self-Check:-1

I. Matching:

Instruction: select the correct answer for the give choice.

A

1. product parameters
2. Tools and equipment
3. Production Planning
4. Work health and safety
5. Textile material

B

- A. proper ventilation
- B. achieve the predetermined goals
- C. Cotton and wool
- D. Spinning wheel
- E. Yarn count

II. SHORT ANSWER

Instruction: write short answer for the given question.

6. Define production planning?
7. List some production parameters?
8. Mention major safety and health issues in the textile industry?
9. List tool and equipment used for produce yarn?

Unit Two: Prepare for Production

This unit to provide you the necessary information regarding the following content coverage and topics:

- Prepare require materials, tools and equipment.
- Check equipment to ensure correct operation.
- Organize and prepare work space.

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:

- Required materials, tools and equipment are prepared.
- Equipment is checked to ensure correct operation.
- Work space is organized and prepared.

2.1. Prepare require materials, tools and equipment

The conventional view is to regard raw materials or parts as input into the production system which converts them into the products. Employees must utilize machinery, tools, materials, or equipment, whether owned by the employee or the industry, in accordance with the safety or health requirements of this production or any industry.

Selecting the proper tool or piece of equipment for a particular job is an important step in maintaining a safe work place. Tools and equipment must be used in accordance with the manufacturer's designed or intended purpose.

2.1.1. Required Tool

Use the proper tool for the job. When possible, purchase tools with ergonomic features. The following guidelines apply to all tools and equipment, and to their operation.

- Cutting tools must be kept sharp. It is the responsibility of the employee using the tool to keep the tool sharp. Exercise caution when using sharp cutting instruments, especially when encountering resistance. When possible, cut away from the body.
- Hammers and other tools having separable handles must have the handle securely fastened to the tool.
- The tips of screwdriver blades must be sharpened and properly dressed to fit screw slots. A screwdriver must not be used as a cutting tool..
- Anticipate the path that a utility knife might take and place your hands and body in a safe position before starting. Injuries can be avoided by cutting away from yourself and others.
- Power tools shall be equipped with on-off or constant pressure switch as designed.

2.1.2. Equipment's/ machine

- Ginning machine
- Reeling machine
- Spinning machine,

2.1.3. Material

- Fiber
- Yarn
- Wax yarn

2.2. Check equipment to ensure correct operation.

You should check equipment as often as suggested by the manufacturer or more often if indicated by the risk assessment. Any daily checks should be undertaken as recommended by the manufacturer. This will help prevent problems such as blockages, leaks or breakdowns, which can increase risks. You'll also need to maintain safety devices around the equipment such as guards, alarms, safety cages and warning signs.

The duty to maintain work equipment and take measures to manage the risks from maintenance (Provision and Use of Work Equipment Regulations) builds on the general duties of the Health and Safety at Work Act, which requires work equipment to be maintained so that it is safe, and work to be undertaken safely, so far as reasonably practicable.

If you use heat-producing equipment you should regularly check the environment around it. You must keep floors clear. There must be adequate ventilation at all times. You also need to remove all combustible materials from the area and regularly maintain and check fire detectors.

- Tools, machines and materials are selected and checked prior to use to ensure that they are appropriate for the work, serviceable and in a safe condition.
- Furniture design, tolerances, process, materials and quantities are determined from work instructions.
- Work sequence is planned.
- Procedures are determined for checking quality at each stage of the process.
- Suitable work area is selected for the task.
- Preparatory drawings/set-outs for tasks are completed where required.
- Tools, machines and equipment are used in accordance with safety requirements and manufacturers' specifications.
- Raw Materials are visually inspected for flaws and faults.
- Spinning, ginning, reeling machine are checked worked properly and identify faults.

2.3. Organize and prepare work space.

- **Time management**

One useful time management trick is distinguishing between events and ordinary to-do items. An event needs to take place at a specific time on a specific day, whereas another type of to do, such as a follow-up call with a networking contact, can be taken care of on a more flexible schedule.

- **Space**

Small business owners "wear so many hats, they usually have pretty limited support staff, and they're idea factories," says Julie Morgenstern, a productivity consultant and the author of organizing from the inside out. "Your workspace has to be organized in a way that accommodates that Morgenstern calls her system for organizing a workspace the kindergarten model: items and documents are organized by roll into what she calls activity zones.

Self-check-Two

Test-I: - CHOICE

Instruction: select the correct answer for the give choice.

1. Which one of the following is needed material used to produce textile product?
A. Spinning machine B. reeling machine C. Fiber D. All
2. ----- is needed equipment used to produce textile product?
A. Yarn B. fiber C. spinning machine D. All
3. Which one the following is used to Organize and prepare work space?
A. OHS practice B. Time management C. housekeeping D. B & C
4. -----is used for preparing for production
A. Organize and prepare work space C. Prepare required material
B. Check equipment to ensure correct operation. D. All

Test II: short Answer writing

Instruction: write short answer for the given question.

1. Mention some raw material used to produce simple textile product?
2. Write down at equipment's used to produce textile product?
3. How to Organize and prepare work space in workplace?

Operation sheet Two

Operation Title: Set Up of Machine for Production

Purpose: To train our trainees about how to set up spinning machine and prepare material for production by studying all steps and procedures

Conditions or Situations for the Operations: The operation process can be performed by following the procedure and steps.

Equipment Tools and Materials: For set up machines equipment and material needed are: - Safety tools like glove, goggle safety boot, and spinning machine part other spinning machines accessory.

PROCEDURE:

1. Apply OHS practice
2. Prepare wool sliver 1.5metre (5ft) length of medium weight yarn for a leader yarn and a 10metre (30ft) length.
3. Thread 12 hooks into the flyer.
4. Assemble the flyer unit.
5. Place the bobbin, small end first, onto the flyer. Then locate the flyer into the bearings
6. Loosely attach the wheel support to the side rails with bolts and barrel nuts
7. Then locate the treadle rail into the holes in the legs and Insert the crank shaft into the wheel support.
8. Attach the flyer unit to the side rails with 2 screws and washers, do not tighten yet. Move the flyer unit until the wheel and large flyer pulley are aligned. Then tighten the screws.
9. Finally check the stability of the machine

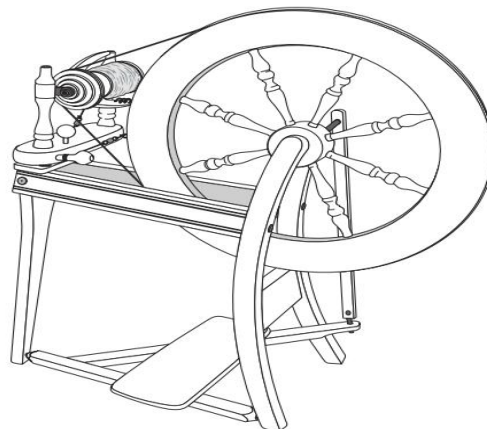


Fig 7. Finale Spinning Machine

PRECAUTIONS:

The operation can be performed by following occupational health and safety rule. Use of proper OHS materials

- Operational workplace activities
- Restricted space
- Hazardous, controlled or exposed conditions
- Work may be conducted in small to large scale enterprises and may involve individual and team activities.

QUALITY CRITERIA: The final operate and monitor spinning machines can be checked by the trainers and trainees .If there is a product fault checking again and if they completed pass to next learning outcome.

Lap Test-Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within 3 hours.

Task 1: Prepare require materials, tools and equipment.

Task 2: Check equipment to ensure correct operation.

Task 3: Organize and prepare work space

Unit Three: Produce Product Using Spinning Machine

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

- Equipment's used to produce lint cotton, yarn cops, cone, hank packages
- Spinning wheel
- Manual ginning machine
- Manual reeling equipment
- Identify and correct minor product process faults.

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:

- Equipment's are used to produce lint cotton, yarn cops, cone, hank packages according to plan and required WHS practices.
- Minor product process faults are identified and corrected where necessary.

3.1. Equipment's used to produce lint cotton, yarn cops, cone, hank packages

3.1.1. Equipment's used to produce lint cotton

Cotton ginning machines are industrial equipment used for cleaning of cotton by extracting seeds from cotton fibers. Cleaning of cotton using these machines is more efficient and economical than manual cotton separation. After passing through a cotton ginning machine, the fibers are then processed into different cotton goods, such as linens, textiles, etc.

Furthermore, different types of cotton ginning machines are available in the market, such as saw and roller cotton ginning machines. Roller ginning machines are of different types, such as single roller, double roller and rot Robar rotary knife roller cotton ginning machines.

3.1.2. Equipment's used to produce yarn cops and con

- Cop winding machines

Cop winding machines are generally used in the textile industry to wind jute and supply the weft yarn. The machine has four heads, which helps it to wind four cops at the same time. It also has clamps that help the machine to control the length of the yarn. Moreover, the shape and size of the cop can be easily adjusted. Tube or bobbins are not used here to form cops, but necessary amount of pressure is needed for the same. Two notable features of cop winding machines are that these machines are completely in auto-stop motion system; and that the output winding package is smaller than the supply package.

- **Pirn winding machines**

Pirn winding machines are available in two types – automatic pirn machines, and ordinary pirn machines. Both these machines are suitable for winding cotton, nylon, silk, wool, and synthetic polyethylene fiber yarns. A pirn winding machine generally consists of four spindles. Two such machines can be joined together to obtain eight spindles, where each unit of 4 spindles and 8 spindles can be driven individually.

3.1.3. Equipment's used to produce hank packages

- **Hank Reeling Machine**

Now a day there is different manual and automatic hank reeling machine. Hank reeling machine used to reel cone yarn to hank yarn form. Automatic hank reeling machine works by use of electric power system and has motor for hank reeling. This machine can wind a maximum number of hanks within one reeling cycle of machine. It's less time consuming, but expensive.

Hand hank reeling machine can wind single hank per reeling cycle and its time consuming than automatic reeling machine. Based on data analysis, the researcher designed and fabricated manual hank reeling machine which can be driven easily by using foot. This machine can wind up to 12 hanks within single hank reeling cycle.

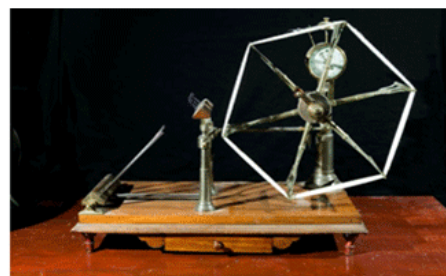


Fig 8. Hank Reeling Machine

3.2. Spinning wheel

How Single Drive spinning Wheel work

- This type of wheel has one drive band around the flyer wheel and the flyer whorl.
- There is usually a separate brake on the bobbin using an adjustable brake band or a tension wire (The Scotch Tension brake system).
- For the purpose of regulating the speed by which the yarn winds onto the bobbin.
- When spinning, a brake is used to hold the bobbin still while the flyer continues to rotate.
- Increased tension on the brake will cause the yarn to pull from your hands and to wind quickly onto the bobbin.
- Single drive wheels are the best choice for beginning hand spinner. The Scotch Tension brake system is easier for beginners to operate and understand.
- The tension on the flyer and bobbin can be set at separate speeds, which provides numerous adjustment levels for the beginner. You will be able to spin a variety of yarn types; soft, lumpy, novelty, etc.



Fig 9. spinning Wheel

Spinning wheel Machin part



3.3. Manual ginning machine

Cotton Ginning Process

- At first, the cotton will go through dryers to reduce moisture content.
- Then the cotton is to go through cleaning equipment to remove foreign particles or materials.
- The cotton is then sent to the air conveyed to gin stands where revolving circular saws pull the lint from the saw teeth by air blasts or by rotating brushes.
- Then the cotton will compress into 500 pounds weight contained bales.
- Then the bales of cotton are shipped to the textile spinning mill for further processes.
- A quality control team will monitor the overall process to ensure quality.

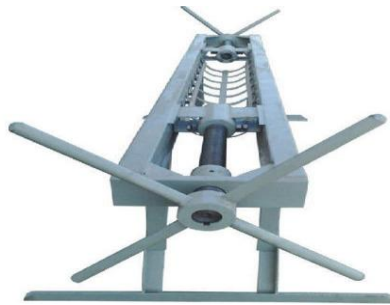


Fig 10. Manual Ginning Machine

3.4. Manual reeling equipment

This machine has a feeding unit to feed cone or cop packed yarn to the reeling unit. There is a yarn traverse rod used to distribute the yarn throughout the hank width. The machine has worm gear with 100 teeth number. The worm gear is connected with the shaft by belt. A small length rod is welded on the worm gear there is a small length rod. In yarn traverse rod a small key like tongue is connected. During reeling, when the shaft rotates one cycle, one of the worm gear teeth forward and a small rod on the worm gear pushes the key like tongue welded on yarn traverse rod. Yarn feed welded on yarn feed Yarn traverse distribute the hank yarn uniformly throughout the width of hank.



Fig 11. Manual Hank reeling Machine design

3.5. Identify and correct minor product process faults.

3.5.1. Fault And Remedies Action in Ginning Process:

Some common faults of ginning process are mentioned in the following:

a. Gin-cut fiber,

When ginning damp or wet cotton, some of the fibers are cut by the saw of the ginning machine. This cut fiber is called cut fiber or gin cut. It is also sometimes called broken fiber.

Causes

- As a result of ginning wet seedlings.
- As a result of the excessive rotation of the saw.
- If the ginning machine is overloaded.

Remedies

- Cotton should not be collected in wet conditions. If the seedbed is wet, it should be dried.
- The rotation of the saw must be controlled.
- The edge of the saw of the ginning machine should be kept properly.

b. Crushed seeds

The seeds that are broken and mixed with the lint during ginning are called broken seeds.

Reason

- Processing of immature seedlings.

- Feeding extra seedbeds as required.
- In case of excessive pressure on the ginning machine knife.

Remedies

- Seedbeds should be collected in mature conditions.
- Seedbeds should be fed in controlled conditions.
- No additional pressure may be exerted on the ginning machine.

c. Knops:

Knops is when the amount of moisture in the seedbed is not specified. Knops is difficult to remove if created.

Reasons

- When ginning wet cotton
- If the fiber is collected before it is cleaned.
- If the saw teeth of the machine are broken or crooked.
- If excess fiber is fed to the ginning machine.
- In case of excessively unequal length scales.

Remedies:

- The moisture content of cotton should be fixed.
- Fiber should be collected after maturation.
- If the saw tooth is broken or crooked, it should be repaired.
- Seedbed should be fed in controlled conditions.
- Fibers of approximately equal length should be fed.

3.5.2. Fault And Remedies Action in Blow Room:

Blow room section plays an important role in textile spinning sector. It is the starting of the spinning operation where fiber tufts are opened, cleaned for producing required quality of yarn. During performing these operations several faults are produced in blow room which are deeply discussed in this article with their causes and remedies.

Faults in Blow Room: Some common faults which are seen in blow room section have pointed out in the below:

A. Irregular lap:

Causes:

- It's occurred due to uneven feeding of fibers to feed lattice.
- Defective regulating motion, swing door, case.
- Incorrect maintenance of machineries.

Remedies:

- Fault free regulating motion should be used.
- Machine maintenance should be perfect.

B. Licking lap:

Causes:

- Improper pressure of calendar roller.
- Too much fan speed.
- Lower opening of cotton.
- Incorrect roller motion setting.

Remedies:

- Necessary pressure of calendar roller should be used.
- Proper roller motion setting should be used.
- Fan speed should be correct.

C. Soft lap:

Causes:

- Lower amount of relative humidity.
- Improper pressure of calendar roller.
- Too much trash content of **fiber**

Remedies:

- Relative humidity should be perfect.

- Proper pressure of calendar roller should be applied.

D. Uneven lap:

Causes:

- Defective regulating motion.
- Uneven feed of material.
- Incorrect machine maintenance.

Remedies:

- Fault free regulating motion should be used.
- Machine maintenance should be accurate.

E. Split lap:

Causes:

- Lower pressure of calendar roller.
- Variation of surface speed of top and bottom cage.
- Low temperature in the blow room section.

Remedies:

- Calendar roller pressure should be accurate.
- Required amount of temperature have to use in **blow room**.

F. Barrel shaped lap:

Causes:

- Accumulation of dirt at both sides of the cage.
- Excessive fan speed.

Remedies:

- After definite period of time, cage must be cleaned.
- Fan speed must be controlled here.

G. Conical lap:

Causes:

- Improper air flow.
- Variation of pressure at both sides of calendar roller.
- More air Intel at one side.
- Dirt drain in one side of cage.

Remedies:

- Pressure of calendar roller have to control.
- Proper air flow should be ensured here.

H. Defective selvedge:

Causes:

- Broken gear teeth or machine parts.
- Faulty surface of lattice.
- Faulty cage.
- Waste accumulation at the side of machine.

Remedies:

- Accurate maintenance of lattice.
- Proper maintenance of cage.

3.5.3. Fault And Remedies Action in Carding Faults in Spinning:

A. Variation of sliver:

Causes:

- Uneven and irregular lap feed.
- Wider setting of taker in to cylinder and feed plate to feed roller.
- Excessive tension between calendar rollers to coiler head.
- Due to damage of calendar roller or doffer or feed plate.

Remedies:

- Lap feeding should be even and regular.
- Perfect setting should be kept at feed plate to feed roller and taker in to cylinder.
- Required tension should be applied between calendar rollers to coiler head.

- Fault free calendar roller or feed plate or doffer should be used.

B. Web Sagging:

Causes:

- Lower amount of humidity.
- Excessive doffer speed.
- Tension draft lower among cylinder and doffer.

Remedies:

- Humidity should be kept at 50-60%.
- Required amount of doffer speed should be used.
- Increasing tension draft among doffer and cylinder.

C. Hole in web:

Causes:

- Different heights of wire points.
- Faulty wire on doffer or card.

Remedies:

- Wire height should be same for all.
- Fault free wire should be used on card or doffer.

D. Cloudy Web:

Causes:

- Wide setting among flats and cylinder.
- Over loading of wire.
- Defective wire on flats, doffer, taker in and cylinder.

Remedies:

- Exact setting should be applied between cylinder and flats.
- Grinding the organs of card.

- Fault free wire should be used on doffer, cylinder, taker in and flats.

E. High nep count:

Causes:

- Too wide setting among flat and cylinder or cylinder and doffer.
- Higher amount of relative humidity %.
- Faulty doffer, taker in wire.
- Improper setting among cylinder to flat and cylinder to doffer.

Remedies:

- Perfect settings have to use between carding cylinder and doffer or flat and cylinder.
- Relative humidity% should be perfect.
- Damage free taker in or doffer wire have to use.
- Correct setting have to apply between cylinder to doffer and cylinder to flat.

3.5.4. Fault And Remedies Action in Spinning:

A. Slubs:-

- Slubs are fish shaped thick places varying from 1cm to 4cm long.
- It is about 5-8 time larger in diameter than the average yarn diameter at the thickest portion.
- Slubs has less twist.
- The strength of the yarn at the slub is sufficient therefore, it passes through ring and traveler gap and thus on to the bobbin.
- These slubs can become a basis of warp breaks in the loom shed or spoil the appearance of superior quality fabrics.

Causes of slubs are:

- The slubs are forms due to poor individualization of fibers at the card.
- Also the slubs are formed at ring frame drafting due to lack of adequate fibre control.

- Due to poor drafting.

Remedies on slubs are:

- In carding, the conditions of wire points should be improved and uniform setting should be required.
- In ring frame, uniformity of pressure on all top rollers and a good condition of the same is important.
- Good condition of aprons and apron spacers are important.

B. Crackers:

- Crackers are the short coil- like places in the yarn.
- When the yarn is stretched the thick coil like fault is straightened sometimes with a cracking noise.
- In the top arm drafting systems crackers are no more a problem in cotton spinning.
- Crackers however occur frequently in polyester or polyester-cotton blend yarns.

Causes of crackers are:-

- Due to the presence of long fiber more than the distance between the front and middle roller.
- Excessive apron or middle roller grip, coupled with high interfere cohesion of fiber between the apron.
- A very low spinning tension can also cause the formation of crackers.

Remedies on crackers are:-

- Increase top arm pressure.
- Buff the top roller(remove any abnormality, if observed)
- Traverse motion functions should be properly.
- Application of large diameter and narrow width top rollers.
- Application of wider apron spacers.
- Increase breaks draft.

- Keep wider back zone setting.
- Use heavier traveler, if necessary.

C. Spinner Double:-

- The name itself indicates that the fault consist of the yarn becoming 'double' in its thickness at the defective portion.
- A spinner's double is normally neither seen at the ring frames, nor caught at the winding machine.
- The fault is observed on the modern winding machine.
- This fault is seen in the fabric as thick yarn in the warp or weft.
- This fault is usually several times longer than the cloth width.

Causes of spinner double:-

- Rove from an inter bobbin in the creel at ring frame going along with the neighboring end.
- Bad piecing- Tender on ring frame permitting doubled rove to fed in to the drafting system, at the time of replacing a near empty inter bobbin at the creel and the strand issuing from the front rollers at ring frames going along with an neighboring end yarn on to the ring bobbin.

Remedies on spinners double:-

- The attentiveness of ring tender. (operator)
- Prevent more breakages in the beginning by running the machine at slow speed.
- Make sure effective working of pneumatic suction system.
- Prevent more creel breaks, by increasing slight twist in roving.

D. Hairiness:-

Hairiness the protruding fibers from the yarn body.

Causes of hairiness are:-

- Badly centered spindles, unstable yarn tension.
- Due to wrong ring and traveler combination.

- Rough machine surfaces, roughen the yarn surface.
- Open anti balloon ring.
- The fibers getting electro statically charged.
- Poor ring centering.
- Friction of the yarn owing to very high traveler weight.
- Rough gliding surface of the ring.

Remedies on hairiness are:-

- To reduce abrasion machine parts.
- Used well combination of ring and traveler.
- Maintain proper humidity in the department

Self-check-Three

Test-I: - CHOICE

Instruction: select the correct answer for the give choice.

1. Which one of the following Equipment's is used to produce yarn cops and con?
 - A. Reeling machine
 - B. Cop winding machines
 - C. ginning
 - D. All
2. ----- is needed Equipment's used to produce hank packages?
 - A. Hank reeling machine
 - B. ginning
 - C. spinning machine
 - D. All
3. Which one the following fault is Caused by Defective regulating motion?
 - A. un even lap
 - B. broken yarn
 - C. thin and thick place
 - D. all
4. -----fault is caused by Due to wrong ring and traveler combination?
 - A. un even lap
 - B. Hairiness
 - C. thin and thick place
 - D. All

Test II: short Answer writing

Instruction: write short answer for the given question.

5. Write down Fault and Remedies Action in Carding Faults in Spinning?
6. Write down Fault and Remedies Action in Ginning Process?
7. Write down Fault and Remedies Action in Blow Room?

Operation sheet-Three

Operation Title: produce yarn.

Purpose: To train our trainees about how to produce yarn by studying all steps and procedures

Conditions or Situations for the Operations: The operation process can be performed by following the procedure and steps.

Equipment Tools and Materials: For set up machines equipment and material needed are: - Safety tools like glove, goggle safety boot, overall Drafting, Twisting machines, and other spinning machines.

PROCEDURE:

1. Apply OHS practice
2. Prepare wool sliver 1.5metre (5ft) length of medium weight yarn for a leader yarn and a 10metre (30ft) length.
3. Sit on a chair in front of the wheel and place your feet on the treadles.
4. Turn the wheel in a CLOCKWISE direction with your hand, and start treadling slowly. Use a heel and toe action.
5. Stop and practice starting again until you feel comfortable treadling.
6. Start by attaching the yarn to the bobbin. Attach the 1.5metre (5ft) leader yarn firmly onto the bobbin. Ensure it does not slide around the center of the bobbin.
7. Feed the leader yarn through the black yarn guide on the left flyer arm, around the cup hook and pull it through the orifice using the threading hook.
8. Hold the yarn at the loop with your front hand. Start treadling slowly clockwise. Allow the yarn to join onto itself. Then feed the yarn into the flyer orifice with your front hand.
9. Keep treadling slowly, allowing the yarn to slide through your back hand.
10. Then monitor the sliver that pass properly to the flyer
11. Follow the steps for operation and monitoring machine operations



Fig 12. spinning machine

PRECAUTIONS:

The operation can be performed by following occupational health and safety rule. Use of proper OHS materials

- Operational workplace activities
- Restricted space
- Hazardous, controlled or exposed conditions
- Work may be conducted in small to large scale enterprises and may involve individual and team activities.

QUALITY CRITERIA: The final operate and monitor spinning machines can be checked by the trainers and trainees .If there is a product fault checking again and if they completed pass to next learning outcome.

Lap Test-3. Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within 3 hours.

Task 1: prepare for production according to the specification and product requirement

Task 2: Producing product using spinning machine

Task 3: Identifying and correcting minor product process faults

Unit Four: Finishing Production Process

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

- Unload or remove product from equipment.
- Assess product against plan.
- Rectify product faults
 - ✓ Foreign matter
 - ✓ Broken yarns
 - ✓ Thick and thin place
- Clean work space and equipment.

Storing tools and equipment. 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:

- Product is unloaded or removed from equipment.
- Product is assessed against plan.
- **Product faults** are rectified.
- Work space and equipment are cleaned.
- Tools and equipment are stored.

4.1. Unload or remove product from equipment

The unloading process consists of the movement of the received product from the machine (ginning, reeling, spinning wheel or other) to the dock floor for proper checking. These goods can arrive on the floor of the container or on pallets. How they arrive helps determine what receiving method is deployed.

Product unloaded can either be transferred to pallets for put-away or product unloaded to conveyor for transfer to storage or other section. In the case of product unloaded transferred to other section, it is necessary to apply a label that contains pertinent product information to each product. This can be a specific label containing both human readable and barcoded information and a generic label containing only a barcode that contains all the information. These cases may also contain tags.

Once the unloading process is started, the check-in process can begin simultaneously if the unloader and checker are separate workers. In some instances they will be the same person.

When remove products from the machine we must:

- Apply OHS practices
- Use unload equipment
- Remove product from the machine

When the running spinning machines yarn can become full ensure that they are wound till the required weight of package

- Check the package is fully wound to the predetermined weight and start doffing.
- If the required weight is not achieved, fix the cone on the machine and continue the process to achieve the required weight and then doff the cone.
- If excess weight is observed, take it for rewinding to reduce the weight to the desired level as instructed by supervisor.
- Follow the instructions of supervisor/Jobber to stop the machine for doffing or doff the package while the machine is running.
- Ensure that the cone doffed is wound up to the desired weight and are within tolerance limit in grams as instructed.
- Keep the hard waste removed during doffing in separate waste collection boxes.

4.2. Assess product against plan.

As in any other industry, to remain competitive manufacturers need to:

- Deliver on time
- Improve productivity
- Respond quickly
- Deliver to a price
- Reduce excess costs
- Introduce best practices
- Achieve accurate and consistent information

4.3. Rectify product faults

4.3.1. Foreign matter

Foreign materials are visually checked and sorted by the worker, moreover they are sorted out by machines in the blow room. Despite this, it cannot be cleaned completely and foreign materials can reach to the yarn.

Foreign materials can be classified as

- Vegetable particles: -
 - ✓ Generally in short length range,
 - ✓ In density spectrum from low to high,
 - ✓ Can be cleaned after processes like bleaching, so it is not necessary to be cleaned in yarn process.
- Foreign fibers and baling materials: -
 - ✓ Spread to the entire spectrum, regardless of length and density,
 - ✓ Have to be cleaned as soon as when they exceed the limits of disturbing foreign material.
- Trash: - Generally long and rarely contains more faults, -
 - ✓ Must be removed at the relevant cleaning limits

4.3.2. Broken yarns

Cause

Sloughing occurs when one or multiple layers of yarn become loose on the supply package. These loose layers can cause yarn to become trapped underneath or behind your yarn package as it's running, resulting in tension spikes and yarn breaks. One simple way to fix the issue is by using foam pads.

Remedies

- Contact points. Make sure there are no cracked guides, no burrs or cuts on any contact surface, and all rollers are turning properly.
- Check tension. Make sure your tensioner is set for the appropriate amount of tension and is functioning properly.

4.3.3. Thick and thin place

Thick places: Cross-sectional size +30% to +100% of normal yarn with fault length ranging from 4 to 25 mm.

Thin places: Cross-sectional size -30% to -60% of normal yarn with fault length ranging from 4 to 25 mm.

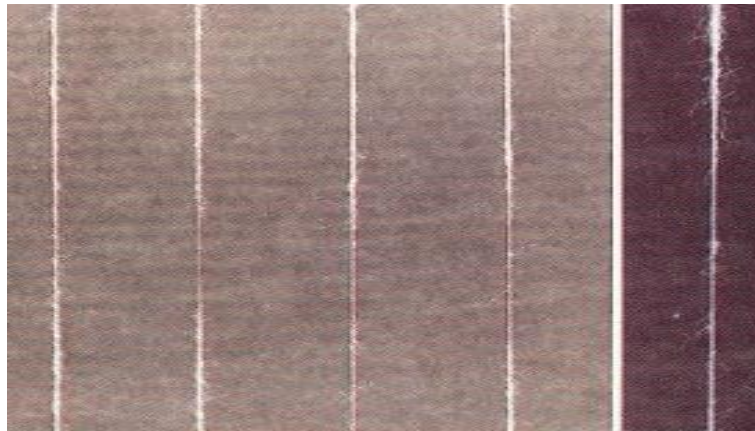


Fig 13. thine and thick place fault

Cause

Thin and thick places are produced due to drafting irregularities and neps are generated due to immature fibers in raw material

Remedies:

- Machine surfaces to be maintained clean.
- Broken teeth gear wheel to be avoided and proper meshing to be ensured.
- Setting at ring frame to be maintained.
- Proper functioning of roller clearers to be ensured.
- Removal of foreign matters (such as jute fibers, color cloth bits) to be ensured during preparation of mixing.
- Vibration of bobbins on the spindles to be avoided.
- Use of optimum roller settings.
- Optimum top roller pressure to be maintained.

4.4. Clean work space and equipment.

Machine should be cleaned before and after use according to the standard for quality product and specification.

Clean the different mechanisms in the machine at the scheduled interval as instructed.

- Periodically clean the parts like drum brush as instructed
- Ensure the waxing discs are clean.
- Keep the wastes in waste bags, piercer bags, or in aprons.
- Clean the waste accumulation from different parts of the machine from time to time. Use proper tools for cleaning.

Self-check Four

Test-I: - CHOICE

Instruction: select the correct answer for the give choice.

1. Which one of the following fault caused by foreign fibers and baling material?
A. Brocken yarn B. thick and thin place C. foreign matter D. All
2. ----- is fault caused due to drafting irregularities?
B. Brocken yarn B. fiber C. thine and thick place D. All
3. Which one the following is used to Organize and prepare work space?
A. Deliver on time B. Improve productivity C. Deliver to a price D. All

Test II: short Answer writing

Instruction: write short answer for the given question.

1. Mention the three foreign materials can be classified?
2. Write down the cause remedies action for thin and thick place fault?
3. Write down the cause remedies action for broken yarn?
4. Mention the steps for remove products from the machine?

Operation Sheet Four

Operation Title: produce yarn.

Purpose: To train our trainees about how to produce yarn by studying all steps and procedures

Conditions or Situations for the Operations: The operation process can be performed by following the procedure and steps.

Equipment Tools and Materials: For set up machines equipment and material needed are: - Safety tools like glove, goggle safety boot, overall Drafting, Twisting machines, and other spinning machines.

PROCEDURE:

1. Apply OHS practice
2. Prepare wool sliver 1.5metre (5ft) length of medium weight yarn for a leader yarn and a 10metre (30ft) length.
3. Sit on a chair in front of the wheel and place your feet on the treadles.
4. Turn the wheel in a CLOCKWISE direction with your hand, and start treadling slowly. Use a heel and toe action.
5. Stop and practice starting again until you feel comfortable treadling.
6. Start by attaching the yarn to the bobbin. Attach the 1.5metre (5ft) leader yarn firmly onto the bobbin. Ensure it does not slide around the center of the bobbin.
7. Feed the leader yarn through the black yarn guide on the left flyer arm, around the cup hook and pull it through the orifice using the threading hook.
8. Hold the yarn at the loop with your front hand. Start treadling slowly clockwise. Allow the yarn to join onto itself. Then feed the yarn into the flyer orifice with your front hand.
9. Keep treadling slowly, allowing the yarn to slide through your back hand.
10. Then monitor the sliver that pass properly to the flyer
11. Follow the steps for operation and monitoring machine operations
12. Doff the product properly
13. Rectify product fault
14. clean the area and handle the waste properly
15. record and document the product properly

PRECAUTIONS:

The operation can be performed by following occupational health and safety rule. Use of proper OHS materials

- Operational workplace activities
- Restricted space
- Hazardous, controlled or exposed conditions
- Work may be conducted in small to large scale enterprises and may involve individual and team activities.

QUALITY CRITERIA: The final operate and monitor spinning machines can be checked by the trainers and trainees .If there is a product fault checking again and if they completed pass to next learning outcome.

Lap Test-Four. Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within 3 hours.

Task 1: prepare for production according to the specification and product requirement

Task 2: Producing product using spinning machine

Task 3: Recognize, rectify and report machine faults or problems in production process

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