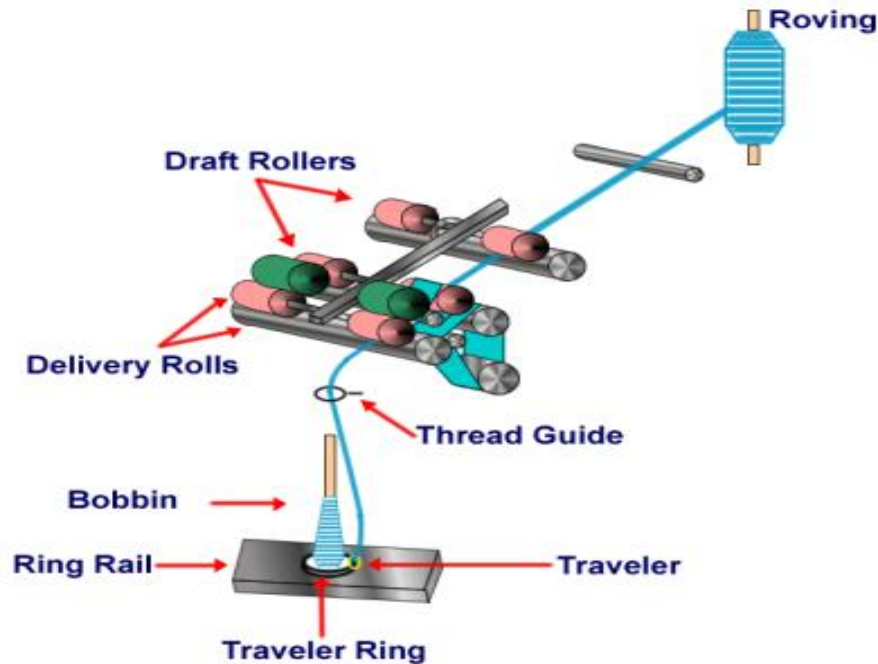


Ginning and Spinning Operation

Level – I

Based on March 2022, Curriculum Version 1



Module Title: - Performing Spinning Operations

Module code: IND GSO1 M07 0322

Nominal duration: 90 Hours

Prepared by: Ministry of Labour and Skill

August, 2022

Addis Ababa, Ethiopia

Table of Content

Acknowledgment.....	4
Acronym.....	5
Introduction to the Module.....	6
Unit one: Determining job requirements of spinning machine.....	7
1.1. Standard operating procedures of spinning machines	7
1.1. Work health and safety (WHS) requirements	14
1.2. Appropriate personal protective equipment (PPE)	17
1.3. Job requirements (Production processes involved in spinning).....	19
1.4.1. Blow room operations	19
1.4.2. Carding.....	19
1.4.3. Drawing.....	19
1.4.4. Roving.....	19
1.4.5. Spinning	20
1.4.6. Winding.....	20
1.4.7. Finishing.....	20
Self-Check 1:- Written Test	21
OPERATION SHEET-1	22
LAP Test 1- Practical Demonstration	24
Unit Two: Operate spinning machines.....	25
2.1. Operation of spinning machines	26
2.1.1. Spinning operations are:-	26
2.1.2. Spinning Process Diagram	26
2.1.3. SPINNING- DRY, WET, MELT.....	34
2.1.4. Basic Process of Spinning Yarn	34
2.1.5. Spinning Natural Fibers	35
2.1.6. Spinning Man-made fibers.....	37
2.2. Feeding and doffing of materials	43
2.2.1. Feeding Material	43
2.2.2. Doffing the product.....	46
2.3. Sorting waste	47

2.4. Clean the machines.....	48
2.5. Machine Faults	48
Self check-2	49
OPERATION SHEET-2	51
LAP Test 2- Practical Demonstration	52
Unit Three: Complete spinning operation	53
3.1. Doffing and replacing products	53
3.1.1. Doffing the product	53
3.1.2. Products are unloaded and dispatched to next process.....	54
3.2. House keeping.....	54
3.3. Production records and other documentation	55
Self-check-3.	57
OPERATION SHEET-3	59
Reference.....	61

Acknowledgment

Ministry of Labor and Skills wish to extend thanks and appreciation to the many representatives of TVET instructors and respective industry experts who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

Acronym

PPE:-personal protective equipment

WHS:-Work health and safety

SOPs:-follow standard operating procedures

Introduction to the Module

Spinning operation is the process of taking textile fibers and filaments and making them into yarn. One important step is spinning the yarn by using spinning machine. For thousands of years, people spun natural fibers into yarn by hand. Today, spinning involves many methods and different machines, depending on what kind of yarn is being made.

This module is designed to meet the industry requirement under the Ginning and Spinning Operation, particularly for the unit of competency: **spinning operation**.

This module covers the units:

- Determining job requirements of spinning machine
- spinning machines operation
- spinning operation finishing

Learning Objective of the Module

- Understand Job requirements and Standard operating procedures of spinning
- Operate of spinning machines
- Know Major Product process and machine faults
- Doff and replace products

Module Instruction

For effective use this modules trainees are 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: Determining job requirements of spinning machine

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

- Standard operating procedures of spinning machines
- Work health and safety (WHS) requirements
- Appropriate personal protective equipment (PPE)
- Job requirements

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:

- Follow standard operating procedures (SOPs)
- Comply with work health and safety (WHS) requirements at all times
- Use appropriate personal protective equipment (PPE) in accordance with SOPs
- Identify job requirements from specifications, drawing job sheets or work instructions

1.1. Standard operating procedures of spinning machines

Machines in modern textile factories turn out many miles of cloth each day. These complicated machines are run by skilled workers and operate at high speeds. Yet cloth can be made without any machines at all. The two basic processes involved spinning and weaving is very simple and was understood by people long before the development of writing.

Spinning is the process of drawing out fibers from a mass and twisting them together to form a continuous thread or yarn. This can be accomplished by hand with the aid of a spindle and distaff or a spinning wheel, using fiber from vegetables or animals, such as flax, cotton, or wool (see natural fibers). In today's textile industry fibers are spun by machine. In the production of synthetic fibers such as rayon, nylon the term spinning refers to the process of squeezing a

synthetic liquid through one or more small openings and letting it harden to form a fiber, much as silkworms and similar insect larvae produce filament to make their cocoons.

A piece of thread is not just a single strand, but several strands twisted together. Each strand is in turn made of fibers, all shorter than the piece of thread that they form. These short fibers have been spun into longer filaments to make the thread or yarn.

Before they are spun, fibers are loose and coarse. They are usually prepared for spinning by cleaning them, removing foreign matter, and straightening the individual strands. During the spinning process, the fibers are drawn, twisted, and smoothed into usable yarn.

The earliest spinning tools probably a spindle and a distaff s still in use in some parts of the world. The mass of loose fibers is tied to the distaff a stick about 1 foot (0.3 meter) long and the spinner attaches fibers from the distaff to the spindle, then allows the spindle to drop slowly to the ground. When the spindle reaches the floor, the spinner winds the thread around the spindle to secure it and then starts the process again. This is continued until all of the fiber is spun or until the spindle is full.

The spinning wheel, probably developed in India and first used in Europe in the middle Ages, was the first improvement on the distaff and spindle. The spinning wheel makes it possible to turn the spindle, twist the fibers, and wind the thread mechanically instead of manually. The distaff is mounted at one end of the spinning wheel. The spinner feeds the fiber by hand to the spindle, which is mounted horizontally and turned as the spinner turns the wheel. A component called the flyer twists the thread just before it is wound on a bobbin. The spindle and bobbin are attached to the wheel by separate parts, so that the bobbin turns more slowly than does the spindle. Thus, thread can be twisted and wound at the same time.

Today spinning in the textile industry is done primarily by machines, though certain extremely fine threads could not withstand the tension of machine spinning and are still spun by hand.

Most machine spinning is done according to two methods

1. Ring spinning.

Ring-spinning machines have hundreds of spindles mounted vertically inside a metal ring. Fibers are fed from above, move down through a guide to the inside of the ring, and pass through

a part called the traveler a sort of revolving guide. The fibers are twisted by the traveler, and then wound on the spindle.

2. Open-End Spinning

A faster method is called open-end, or breaks, spinning. Whereas in ring spinning the fibers are twisted and wound simultaneously, these steps are separate in open-end spinning. Fibers are pulled apart, or opened, by means of suction. They travel one by one across a break, or an empty space, and are twisted to the ends of fibers that have preceded them. Then the fibers are twisted, or closed. Open-end spinning is impractical for spinning thread made of numerous fine fibers; it is used primarily for coarse fibers.

The characteristics of the final spun yarn depend in part on the amount of twist given to the fibers during spinning. A fairly high degree of twist produces strong yarn; low twist produces softer, more lustrous yarn; and very tight twist produces crepe yarn. (For a description of spinning of synthetic fibers, see man-made fibers, “Mechanical Processing.”

Setting of machines according to product requirements like:-

- Count
- Twist
- Ply
- Tension
- Weight
- Lubrication
- twist direction
- strength
- Extension
- Hank/count

Machine setting is adjusted for product requirement

- Machine is started and stopped in accordance with manufacturer requirements. Machine operations are monitored to ensure correct operation.
- Waste is sorted according standard procedure. Machine is cleaned when required.
- Product process and machine faults are identified and corrected where necessary to meet specified requirements:-

Machine operations may include:-

- Drafting
- Twisting
- Splicing
- Piecing up, joining and Fault identification

Table 2- Material flow in spinning /carded yarn manufacturing/



STAGE	MACHINE	INPUT MATERIAL	OUT PUT MATERIAL	PACKAGE FORM
Opening & cleaning	Blow Room machines	Raw cotton	Lap or chute feed	-
Carding	Card	Lap or chute feed	Card sliver	Slivers in Can
1 st drawing	Breaker Draw frame	Card sliver	Drawn sliver	Sliver can
2 nd drawing	Finisher Draw frame	Drawn sliver	Drawn sliver	Sliver in can for Roving
Roving	Speed Frame	Drawn sliver	Roving	Roving bobbin
Spinning	Ring spinning frame	Roving	Ring-spun yarn	Spinning Cops
Post-Spinning processes	Winding & Reeling	Yarn in spinning cops	Yarn	Cone, Cheese & Hank

Table 3- Combed Yarn Manufacturing

STAGE	MACHINE	INPUT MATERIAL	OUT PUT MATERIAL	PACKAGE FORM
Opening & cleaning	Blow Room machines	Raw cotton	Lap or chute feed	-
Carding	Carding machine	Lap or chute feed	Card sliver	Carded Slivers in Cans
Pre comber Drawing	Breaker Draw Frame	Carded Sliver	Drawn Sliver	Drawn slivers in cans
Lap Formation	Super Lap or Lap Former	Drawn Slivers	Lap	Laps in spools
Combing	Comber	Lap	Combed Sliver	Combed sliver in Cans
Post comber Drawing	Finisher Draw Frame	Combed sliver	Drawn sliver	Post comber Draw frame slivers in cans
Roving	Speed Frame	Post comber Draw frame sliver	Roving	Roving bobbin
Spinning	Ring spinning frame	Roving	Ring-spun yarn	Spinning Cops
Post-Spinning processes	Winding & Reeling	Yarn in spinning cops	Yarn	Cone, Cheese & Hank

Table 4-Open End Yarn Manufacturing

STAGE	MACHINE	INPUT MATERIAL	OUT PUT MATERIAL	PACKAGE FORM
Opening & cleaning	Blow Room machines	Raw cotton	Lap or chute feed	-
Carding	Card	Lap or chute feed	Card sliver	Slivers in Can
Drawing	Draw frame	Card sliver	Drawn sliver	Sliver can
OE Spinning	OE Frame	Drawn sliver	OE yarn	Cheese

Twist in Spun Yarns

Twist is necessary in spun yarns in order for the yarn to have adequate strength for a given end use. However, added twist will make the yarn harsher, stiffer, and have more torque. The following is a list of yarn properties affected by twist: diameter or fineness, contraction, softness/hand, torque or liveliness, bending behavior, absorbency, covering power, permeability, tensile strength, stretch and recovery, crease resistance, abrasion resistance, pilling behavior, and luster.

The amount of twist in a spun yarn is described as turns per inch (tpi). There are two directions of twist, Z and S. As mentioned previously, Z and S twist yarns can be formed in ring spinning but only Z twist in open end spinning. Air jet yarns do not have a true conventional twist; however, MJS machines are offered in both Z and S fiber wrap directions. Figure 24 gives a drawing of “Z” and “S” twist of fibers in a yarn.

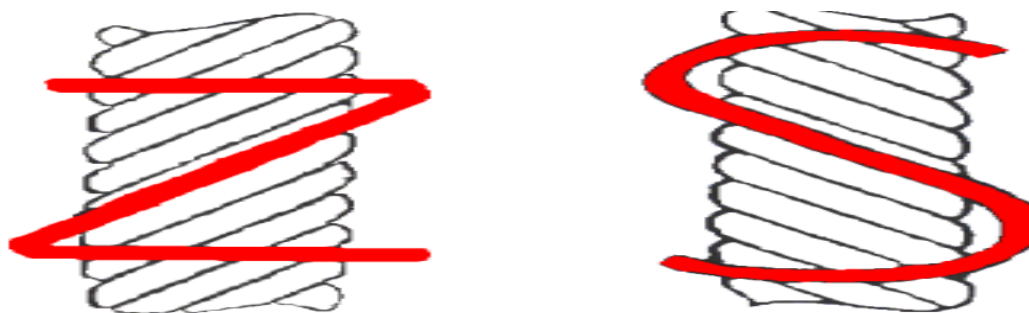


Fig:- types of twisting

1.1. 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 fibre 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
- B. Exposure to noise
- C. Ergonomic issues

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, bicipital 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 equipments 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.

1.2. Appropriate personal protective equipment (PPE)

Employers must protect employees:

- Assess the workplace
- Eliminate and reduce the hazards found using engineering and administrative controls
- Then use appropriate personal protective equipment Remember, Personal Protective Equipment is the last level of control.
- PPE controls: Requires worker to wear something Examples

The following are some of personal protecting materials

No	Materials	Description
1		Body safety cloth (tuta): - This cloth is a type of cloth which covers all the body part except the head and the fingers. It is used to protect the body from dirty.
2		Sun hat:- is the material, that is used to protect head from direct sun radiation




3		Eye protecting device: - it is used to protect the eye from different damages
4		Boot:- it is used to protect leg from sharpen and other damaging
5		Hand glove: - which is made of leather or strong flexible plastic rubber, it used to cover fingers to protect from sharpen materials.

Table1. PPE

Training requirements:

- Each employee who is required to use PPE must be trained to know:
 - ✓ When PPE is necessary
 - ✓ What PPE is necessary
 - ✓ How to properly put on, take off, adjust, and wear the PPE
 - ✓ The limitation of the PPE
 - ✓ Proper care, maintenance, useful life, and disposal of PPE

1.3. Job requirements (Production processes involved in spinning)

Common industrial spinning techniques include ring spinning, open-end (rotor) spinning, and air-jet spinning. The process description of a typical ring spinning process is depicted below.

Production processes in spinning

1.4.1. Blow room operations

The blow room machinery performs the function of opening pressed bales of cotton and cleaning the cotton of impurities. Trash and foreign matter is extracted from the cotton with the least amount of lint loss. Blow room line consists of opening, cleaning, mixing and lap making machine. In order to produce uniform quality of yarn and also to reduce the cotton cost of yarn while achieving the desired level quality, mixing of two or more types of cotton is carried out in the blow room. The loose cotton passed through the blow room machinery is converted into regular sheets called laps.

1.4.2. Carding

The material received from Blow room is processed on the Carding machines which produce a thin sheet of uniform thickness that is then condensed to form a thick, continuous, untwisted strand called sliver. This process also removes the remaining impurities from the cotton.

1.4.3. Drawing

The fibers in the carded sliver are placed in a haphazard fashion and lack uniformity. The carded slivers are processed on the drawing frame; they are made uniform in thickness by the doubling process. The fibers get drawn parallel to the axis of the sliver by the drafting process.

1.4.4. Roving

Slivers are to be thinned out to the level required for the yarn to be spun. This process of attenuating the slivers is done in several steps on Speed Frames. While converting slivers into roving, a small amount of twist is also inserted so that the roving can withstand the winding and the unwinding operations.

1.4.5. Spinning

The roving bobbins are taken to the ring frames where it is drafted (extended) to the extent of desired level (i.e. count). The spindle along with the ring traveller mounted on a ring imparts the requisite amount of twist into the yarn. The yarn is wound on bobbins and taken to post spinning operations.

1.4.6. Winding

The yarn is wound over paper cones to make final packages after passing through electronic yarn cleaners for removal of any defects. The ends are ‘spliced’ to produce knot-less yarns.

1.4.7. Finishing

Self-Check 1:- Written Test

Further operations on the yarn, such as Bleaching, Dyeing, and Packaging will depend on the intended usage of the yarn.

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. What are the Production processes involved in spinning?
2. Why we apply OHS before performing every activity?
3. There are several safety and health issues of the product specification List some of safety and health issues?
4. List some spinning Machine operations?

OPERATION SHEET-1

OPERATION TITLE: Set up machines.

PURPOSE:

To train our trainees about the way of setting machines 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:

To perform machine setting use equipment and material needed are :- For set up machines equipment and material needed are :-safety tools like glove, goggle safety boot ,overall bale pucker machines, opener machines, blender machines, card machines ,draw frame machines.lap former machines ,comber machines ,roving frame machines and other

Page 22 of 64	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1
			August, 2022

PROCEDURE:

1. Apply OHS practices
2. Prepare all machine part i.e. pedaled, flyer, spindle, ring etc...
3. First put the pedal
4. Second connect the pedal and the gear by belt
5. Put the flyer on flayer holder
6. Then put ring on flyer
7. Finally the travers put on the ring
8. clean the area and handle the waste properly

PRECAUTIONS:

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

- standard procedures 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 an standard procedures checking again and if they completed pass to next learning out come.

LAP Test 1- Practical Demonstration

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

Task 1: Identify necessary standard procedures for product.

Task 2: Set up pre spinning machine according to the standard procedures

Task 3.:Load the product according to the procedures

Unit Two: Operate spinning machines

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

- Operation of spinning machines
- Feeding and doffing of materials
- Sorting waste
- Cleaning machine
- Product process and machine faults
- Major machine 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:

- Starting and stopping Machine in accordance with manufacturer's requirements
- Input materials are feeding to the machines and output materials are doffing from the machines.
- Waste is sorting according to standard procedure
- Machine is cleaning when required
- Product processing and machine faults are identifying and correcting where necessary to meet specifying requirements

- Major machine faults are reported

2.1.1. Spinning operations are:-

- Paralleling
- Drafting
- Twisting
- Splicing
- piecing up, joining
- doubling

2.1.2. Spinning Process Diagram

- | | |
|--------------|---------------|
| A. Blow room | E. Combing |
| | F. finishing |
| B. Carding | G. roving |
| C. Drawing | H. ring frame |

A. Blow room

Functions of Blow Room Machines:

Opening: To open the compressed bales of fibres & to make the cotton tuft as small as possible.

Cleaning: To remove dirt, dust, broken seeds, broken leaves, and other foreign materials from the fibers.

Mixing & Blending: Uniform mixing/blending of fibers of different varieties.

2.1.1. Operation of spinning machines	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1
			August, 2022

Lap or flocks formation: To transfer opened and cleaned fiber into sheet form of definite width and length which is called lap or in modern system directly feed the material to the carding machine in flock form.

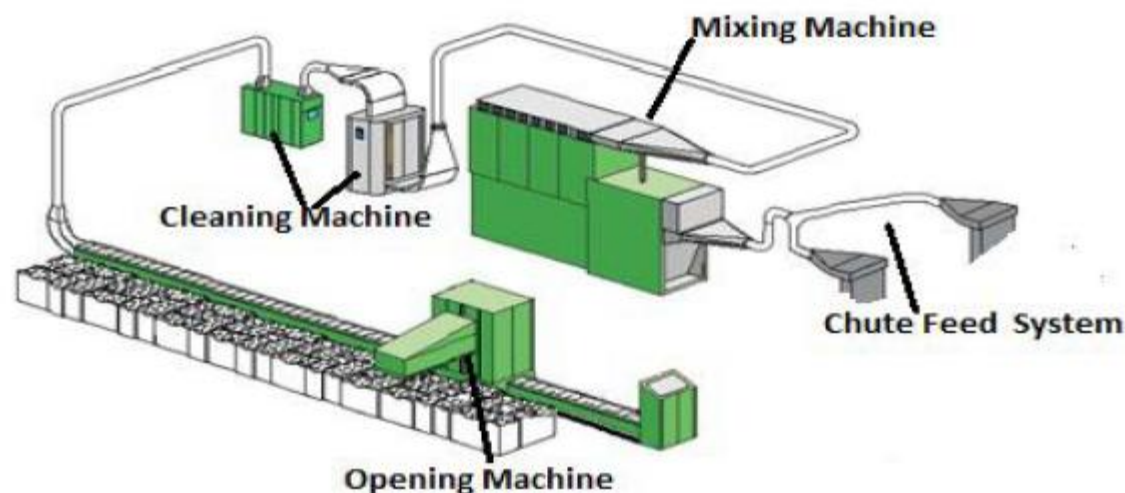


Fig. Detail of Blow Room Machine

Operating Blow room machines:

Laying the bales

- Ensure receipt of correct bales as per supervisor's instruction from bale godown.
- Lay the bales as per the plan given in bale plucker.
- Open the bale hoops, remove covering cloth and clean the sides of bales.
- Ensure proper identification of the bales & remove the bale straps properly.
- Use proper material handling tools for transporting and opening the bales.
- Keep the bale straps properly at specified place.

- In case of manual feeding ensure the correct colour coded mixing is available near the feeding point and feed the mixing as specified.

B. Carding

Functions of Carding Machine:

- To individualize the fibers.
- To remove impurities.
- To clean cotton thoroughly off the lighter dirt & trash as well as to remove a certain proportion of neps & short fibers from the opened material.
- To convert Blow Room lap/ Chute feed sheet into the loose, roughly parallel, untwisted strand fibers called 'sliver'.

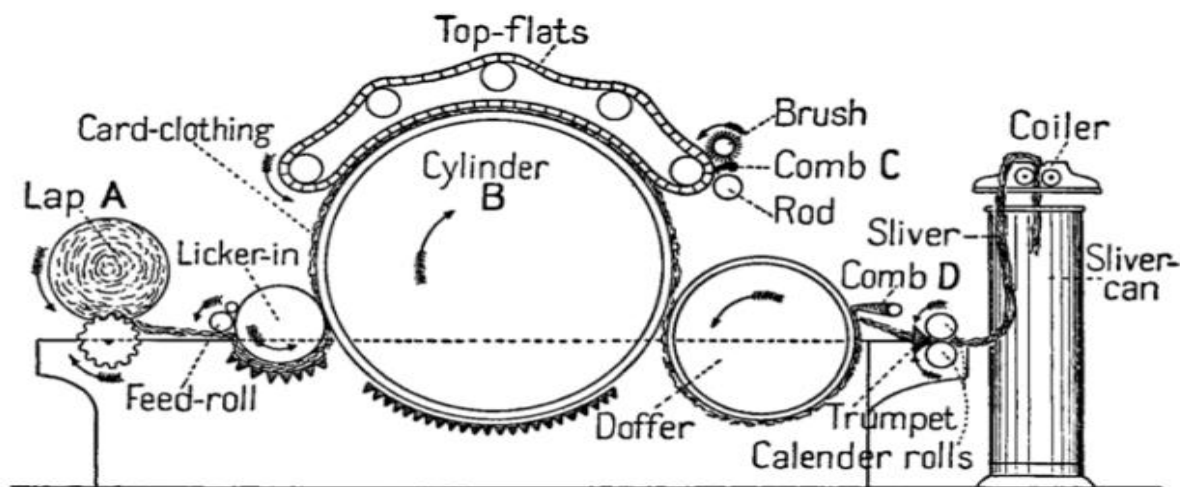


Fig detail of carding machine

Operating Carding Machine:

- A carding operator should be able to operate the carding machine, ensure proper feeding of material in chute/lap feed system, piece the sliver on breakage, doff the cans and transport to the storage area.
- Start the machine as per instructions given by shift supervisor.
- Check that the card web is properly condensed and sliver is delivered.
- Follow the different signal lamps used in machines & understand the stop motions.
- Check the proper functioning of card by verifying the control panel.
- Check whether the material is properly fed in the carding machine via chute/lap feed system
- Identify sliver breakages and piece the sliver during breakage. While piecing the sliver do not do too soft or too hard piecing.
- Segregate the sliver waste & card drop waste as per supervisor instructions. Check that all the cards have correct colour coded laps/chute feed. Check the availability of empty sliver cans. During normal course of working if any abnormalities detected inform immediately to supervisor for suitable action.

C. Draw Frame

Functions of Draw Frame Machine:

- To straighten the curled and hooked fibres.
- To make the fibres parallel to their neighbouring fibres.
- To improve uniformity of fibres by drafting and doubling.
- To reduce weight per unit length of sliver.
- To remove micro dust from slivers by air suction pipe.
- To blend raw material of same hanks perfectly.

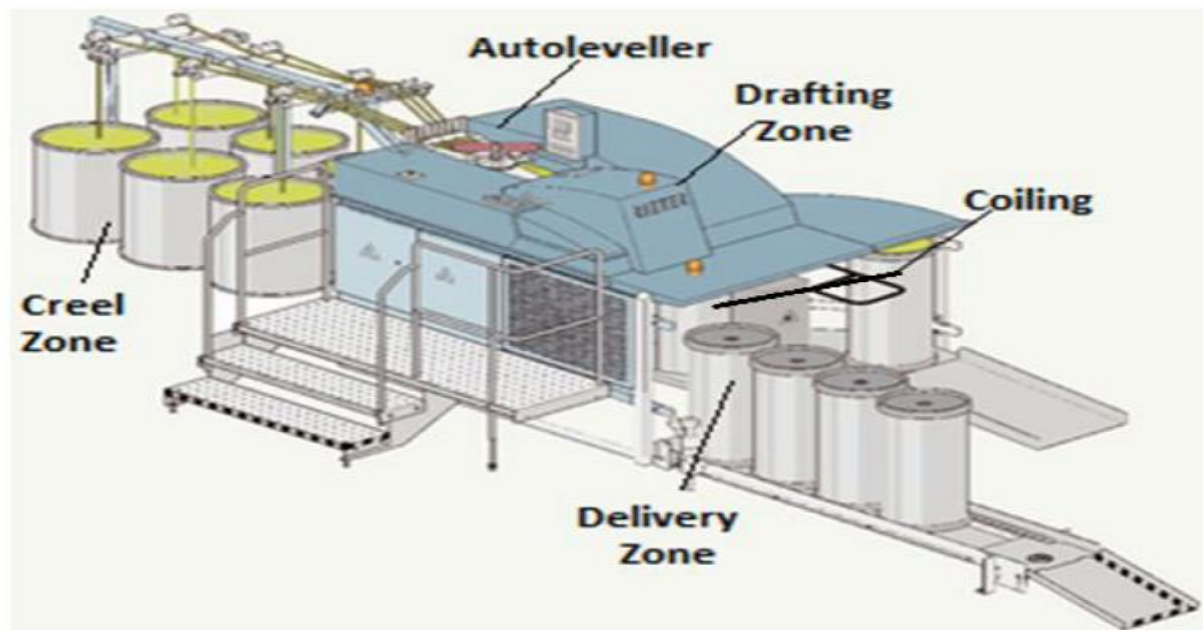


Fig detail of draw frame machine

Operating Draw Frame Machine:

- Creel the required number of cans and draw the slivers forward.
- Take the slivers through all guide rollers and feed to drafting zone.
- Operate the control switches for inching, starting and stopping the draw frame.
- By inching feed the material and start running.
- Follow the different signal lamps & stop motions used in machines.
- Piece the sliver during breakage & Doff the full sliver cans.
- View the display panel and identify the reasons for machine stoppages if any.

- Inform the supervisor and maintenance in charge in case of a jam and in case of any break-downs support to carry out maintenance activities.
- Carryout cleaning activities in creeling, drafting, and delivery zones.
- Remove the suction waste periodically & segregate the wastes collected and put them in the designated bins.
- Always keep Draw frame area clean.

D. Roving Frame

“Roving frame is known as necessary evil”. The problem is that this machine has many complications, creating faults which have no solution, increasing production costs, its finished product is sensitive while using in winding and unwinding operations. Then, why this machine is still in use?

It has two reasons:

1. As far as the structure of drawing sliver is concerned it is thick and hairy and creates fly during working. Draft needed to convert this thick sliver into a yarn is 300 to 500 so, it is not possible for ring machines to make a yarn on this single drafting system that fulfill all the demands.
2. Presentation of feed material to the ring spinning department and draft can signify the worst conceivable mode of transportation.(Gilbert R. Merrill)



Fig.13 Roving frame

Tasks of Roving Frame (Bernard P. Corbman, 1983)

- Attenuation-drafting the sliver into roving.
- Twisting the drafted strand.
- Winding the twisted roving on a bobbin.

E. Ring Frame

From the early ages of history, the production of yarn has been done by spindles. During the last centuries many spinning machines came out but no one has been able to replace the ring spinning machine.

Advantages of ring spinning frame

- We can make every count of yarn in this machine
- The material obtained from this machine has optimum characteristics, especially if we talk about structure and strength

- Very simple and easy to monitor
- Very modernized, less efforts required and accessible for everyone.
- In case of fine counts it is usually 200 bags/day while if course counts will be processed it reaches up to 400 bags.
(Spin Plan ATM, 2007).

Tasks of Ring Spinning Frame

Drafting:-The purpose of drafting is to get the desired thickness.

Twisting :-The twist has its own importance for inserting the strength in the yarn

Twist:- interlocks the fibers with one another.

Package formation:- At the end the yarn is wound on small packages (ring bobbins) and stores it for further processes.

Working principle

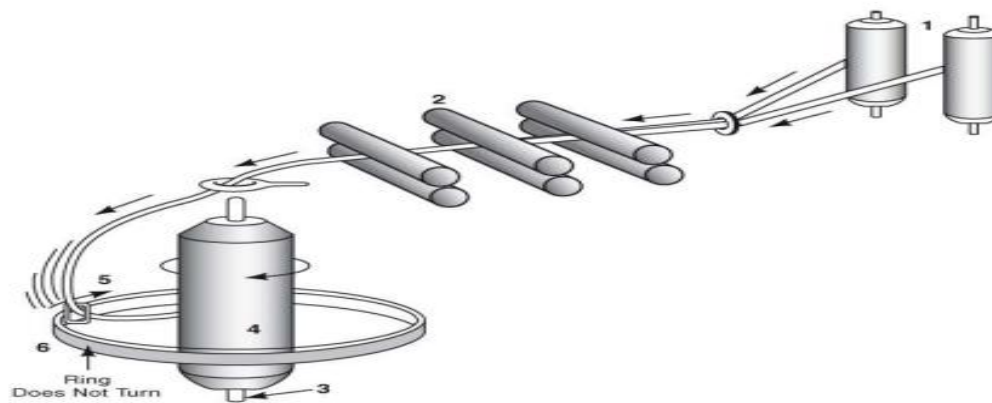


Fig. Sectional view of Ring Spinning Frame

The process starts from the output of simplex machine which is called “roving”. Roving is wound on roving bobbins

- with the help of guides this roving is fed to the pair of drawing rollers

- which draws this thick strand to its final desired count. The ring bobbin which is inserted into the spindle is moving with the constant speed.
- The speed of first two pairs of drafting rollers is almost same but the final pair rollers speed is adjusted according to amount of yarn delivers so that it is twisted by the desired quantity as it is wound on the bobbin. The yarn is directed by the traveler
- The traveler imparts twist to the yarn and is present on the ring surface around the bobbin.
- Due to yarn insertion from traveller it drags and yarn winds on the bobbin with the same speed as the front rollers.

The traveler's rotational speed is less than the spindle speed by reason of the frictional force produced when it slides on the ring surface and one more factor is the air resistance due to the motion of yarn between the yarn guide and the traveler.

2.1.3. SPINNING- DRY, WET, MELT

For thousands of years, people spun natural fibers into yarn by hand. Today, spinning involves many methods and different machines, depending on what kind of yarn is being made. Before we discuss how spinning works, let's review some basics. Fibers are short, natural hairs that come from plants like cotton and animals like sheep. Filaments are long continuous single strands. Silk is a natural filament, but most filaments are synthetic or man-made materials, like polyester and nylon. Converting fibers and the substances that form synthetic filaments into yarn involves different methods of spinning.

2.1.4. Basic Process of Spinning Yarn

First, let's look at the basics of spinning, which can be done with very simple tools. To make a natural yarn, you gather cleaned and prepared natural fibers like wool or cotton. Using a tool called a spindle, a rounded stick with tapered ends; you pull the fibers by hand onto it as the spindle twists. To aid the process, the spindle is weighted by something called a whorl, a small, round stone or piece of wood which allows the spinning to be maintained at a regular speed. The process of pulling and twisting results in a piece of yarn.

2.1.5. Spinning Natural Fibers

This basic spinning process was used for natural fibers. It is how the process worked for thousands of years. Then, advances in tools and technology made spinning more efficient. In 1828, a machine was invented that allowed a method called ring spinning to mechanize the process. During this process, hundreds of spindles are mounted vertically on a machine that spins fibers into yarns.

Ring spinning is still the way many fibers are turned into yarn, but in the 20th century another method was invented. Today, some yarns are made through rotor or open-ended spinning. In this method, the fibers are fed into a rotor and blown with air into a system that turns them into yarn without using a spindle. Yarns created by rotor spinning tend to be bulkier and heavier than those made by ring spinning.

Spinning is the twisting technique where the fiber is drawn out, twisted, and wound onto a bobbin. The yarn issuing from the drafting rollers passes through a thread-guide, round a traveler that is free to rotate around a ring, and then onto a tube or bobbin, which is carried on to a spindle, the axis of which passes through a center of the ring. The spindle is driven (usually at an angular velocity that is either constant or changes only slowly), and the traveler is dragged around a ring by the loop of yarn passing round it. If the drafting rollers were stationary, the angular velocity of the traveler would be the same as that of the spindle, and each revolution of the spindle would cause one turn of a twist to be inserted in the loop of yarn between the roller nip and the traveler. In spinning, however, the yarn is continually issuing from the rollers of the drafting system and, under these circumstances, the angular velocity of the traveler is less than that of the spindle by an amount that is just sufficient to allow the yarn to be wound onto the bobbin at the same rate as that at which it issues from the drafting rollers.

Each revolution of the traveler now inserts one turn of twist into the loop of yarn between the roller nip and the traveler but, in equilibrium, the number of turns of twist in the loop of yarn remains constant as the twisted yarn is passing through the traveler at a corresponding rate.

Types of fiber

Artificial fibers are made by extruding a polymer through a spinneret into a medium where it hardens. Wet spinning (rayon) uses a coagulating medium. In dry spinning (acetate and triacetate), the polymer is contained in a solvent that evaporates in the heated exit chamber. In melt spinning (nylons and polyesters) the extruded polymer is cooled in gas or air and sets. All these fibers will be of great length, often kilometers long.

Natural fibers are from animals (sheep, goat, rabbit, silkworm), minerals (asbestos), or plants (cotton, flax, sisal). These vegetable fibers can come from the seed (cotton), the stem (known as bast fibers: flax, hemp, jute) or the leaf (sisal). Many processes are needed before a clean even staple is obtained. With the exception of silk, each of these fibers is short, only centimeters in length, and each has a rough surface that enables it to bond with similar staples.

Artificial fibers can be processed as long fibers or batched and cut so they Yarn and Its Types

Self-Instructional Material can be processed like a natural fiber.

Methods

Ring spinning is one of the most common spinning methods in the world. Other systems include air-jet and open-end spinning, a technique where the staple fiber is blown by air into a rotor and attaches to the tail of formed yarn that is continually being drawn out of the chamber. Other methods of break spinning use needles and electrostatic forces.

The processes to make short-staple yarn (typically spun from fibers from 0.75 to 2.0") are blending, opening, carding, pin-drafting, roving, spinning, and—if desired—plying and dyeing. In long staple spinning, the process may start with stretch-break of tow, a continuous "rope" of synthetic fiber. In open-end and air-jet spinning, the roving operation is eliminated. The spinning frame winds yarn around a bobbin. Generally, after this step the yarn is wound to a cone for knitting or weaving.

In a spinning mule, the roving is pulled off bobbins and sequentially fed through rollers operating at several different speeds, thinning the roving at a consistent rate. 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 ring spinning. Spinning by the mule machine is

an intermittent process as the frame advances and returns. It is the descendant of a device invented in 1779 by Samuel Crompton, and produces a softer, less twisted thread that is favored for fines and for weft.

The ring was a descendant of the Arkwright water frame of 1769 and creates yarn in a continuous process. The yarn is coarser, has a greater twist, and is stronger, making it more suitable for warp. Ring spinning is slow due to the distance the thread must pass around the ring. Similar methods have improved on this including flyer and bobbin and cap spinning.

The pre-industrial techniques of hand spinning with a spindle or spinning wheel continue to be practiced as handicraft or hobby and enable wool or unusual vegetable and animal staples to be used.

2.1.6. Spinning Man-made fibers

Melt Spinning, Dry spinning and Wet Spinning Method

Man-made fibers are manufactured by spinning the polymer. There are three major types of spinning process. They are-

- Melt Spinning (It is used for polymers that can be melted easily.)
- Dry Spinning (It involves dissolving the polymer into a solution that can be evaporated.)
- Wet Spinning (It is used when the solvent can't be evaporated and must be removed by chemical means.)

Melt Spinning

Melt spinning uses heat to melt the polymer to a viscosity suitable for extrusion. This type of spinning is used for polymers that are not decomposed or degraded by the temperatures necessary for extrusion. This method is used by 70% of the fibers.

- Spinning process: In melt spinning, polymer is heated and it melts to form a liquid spinning solution or dope.
- Chips of polymers are fed to a hopper which is heated. There is a grid (sieve) at the base which permits only molten liquid to pass through.

- Then the solution is purified by filter.
- The molten polymer is extruded at high pressure and constant rate through a spinneret into a relatively cooler air stream that solidifies the filaments.
- Finally the filament yarn either is immediately wound onto bobbins or is further treated for certain desired characteristics or end use.

Example: Melt spinning is used for the production of polyester, nylon, olefin, saran and glass fibers.

Advantages:

- High speed (275 to 1500 yds/min); (4000 yds/min spin draw)
- No solvents
- No purification problems

Disadvantages:

- Separate drawing step (unless spin draw)



Fig: Principle of Melt spinning

Dry spinning

Dry spinning is used for polymers that need to be dissolved in a solvent. Solvent spinning (dry spinning and wet spinning) are used by 30% of the fibers.

Spinning process:

- In dry spinning, a volatile solvent is used to dissolve the raw materials and form a solution.
- Then the solution is purified by filter.
- The solution is extruded through a spinneret into a warm air chamber where the solvent evaporates, solidifying the fine filaments.
- Finally the filament yarn either is immediately wound onto bobbins or is further treated for certain desired characteristics or end use.

Example: Dry spinning is used in the production of acetate, triacetate, and some acrylic, modacrylic, spandex, and vinyon (PVC,PVA) fibers.

Advantages:

- Yarn does not require purification

Disadvantages:

- Flammable solvent hazards
- Solvent recovery
- Slow (200-400 yds/min)

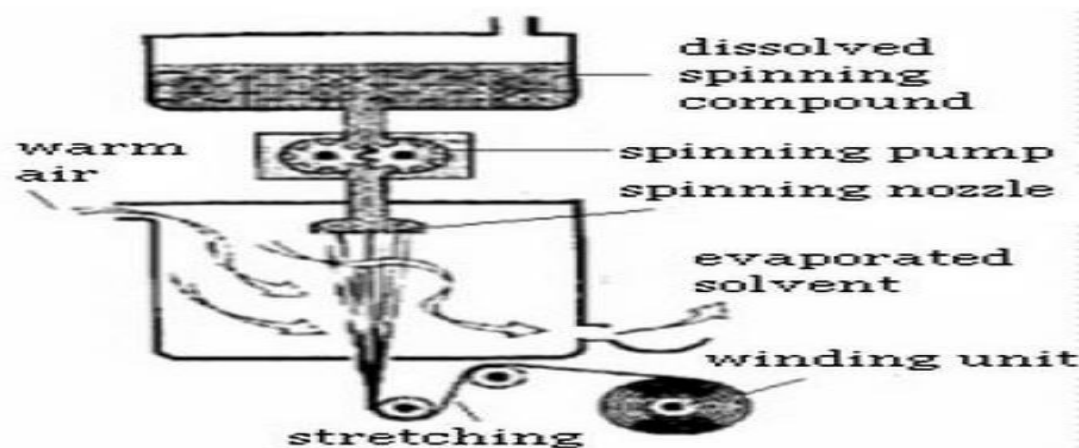


Fig: Principle of dry spinning

Wet Spinning

This is the oldest, most complex and also the most expensive method of man-made yarn manufacture. This type of spinning is applied to polymers which do not melt and dissolve only in non-volatile or thermal unstable solvents.

Spinning process:

- In wet spinning, a non-volatile solvent is used to convert the raw material into a solution.
- The solvent is extruded through the spinneret either by simply washing it out or by a chemical reaction between the polymer solution and a reagent in the spinning bath.
- After extrusion, the solvent is removed in a liquid coagulation medium.
- Finally the filament yarn either is immediately wound onto bobbins or is further treated for certain desired characteristics or end use.

Example: Wet spinning is used in the production of aramid, Lyocell, PVC, Vinyon Basics of Textiles (PVA), viscose rayon, spandex, acrylic and modacrylic fibers.

Advantages:

- large tows can be handled

Disadvantages:

- Slow (70-150 yds/min)
- Washing to remove impurities
- Solvent and chemical recovery

Spinning (polymers)

Spinning is a manufacturing process for creating polymer fibers. It is a specialized form of extrusion that uses a spinneret to form multiple continuous filaments. There are many types of spinning: wet, dry, dry jet-wet, melt, gel, and electro spinning.

Process

First, the polymer being spun must be converted into a fluid state. If the polymer is a thermoplastic then it can be simply melted, otherwise it is dissolved in a solvent or chemically treated to form soluble or thermoplastic derivatives. The molten polymer is then forced through the spinneret, and then it cools to a rubbery state, and then a solidified state. If a polymer solution is used, then the solvent is removed after being forced through the spinneret.

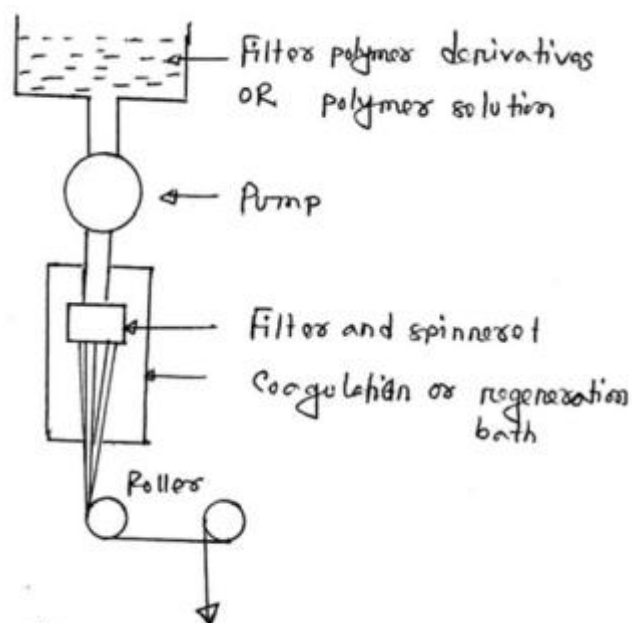


Fig: Principle of wet spinning

Other types of spinning

Gel spinning

Gel spinning, also known as dry-wet spinning, is used to obtain high strength or other special properties in the fibers. The polymer is in a "gel" state, only partially liquid, which keeps the polymer chains somewhat bound together. These bonds produce strong inter-chain forces in the fiber, which increase its tensile strength.

The polymer chains within the fibers also have a large degree of orientation, which increases strength. The fibers are first air dried, then cooled further in a liquid bath. Some high strength polyethylene and aramid fibers are produced via this process.

Electro spinning

Electro spinning uses an electrical charge to draw very fine (typically on the micro or nano scale) fibers from a liquid - either a polymer solution or a polymer melt.

Electro spinning shares characteristics of both electro spraying and conventional solution dry spinning of fibers. The process does not require the use of coagulation chemistry or high temperatures to produce solid threads from solution. This makes the process particularly suited to the production of fibers using large and complex molecules. Melt electro spinning is also practiced; this method ensures that no solvent can be carried over into the final product.

Drawing

Finally, the fibers are drawn to increase strength and orientation. This may be done while the polymer is still solidifying or after it has completely cooled.

2.2. Feeding and doffing of materials

2.2.1. Feeding Material

Fiber: The fundamental component used in making textile yarns and fabrics. Fibers are fine substances with a high ratio of length to thickness. They can be either natural (e.g. cotton, wool, silk etc.) or synthetic (e.g. polyester, nylon, acrylic etc.).

Cotton Bale:

A commercial package consisting of cotton lint tightly compressed, covered with bagging and bound with metallic or polymer straps. Normally cotton bale weighs around 170 Kgs.

Chute feed/ Lap:

The feed material for carding is in the form of Blow Room lap or by direct Chute feed system, In chute feed system the small tufts of fibres (sheet form) fed directly from blow room to a series of cards, arranged in a circuit through pneumatic pipe.

Breaker Draw frame:

Feed material is card sliver. During this process 6-8 carded slivers are fed to this machine to produce more parallelized breaker sliver.

Chute feed system:

It is a system of feeding small tufts of fibers directly from blow room to a series of cards, arranged in a circuit through pneumatic pipe.

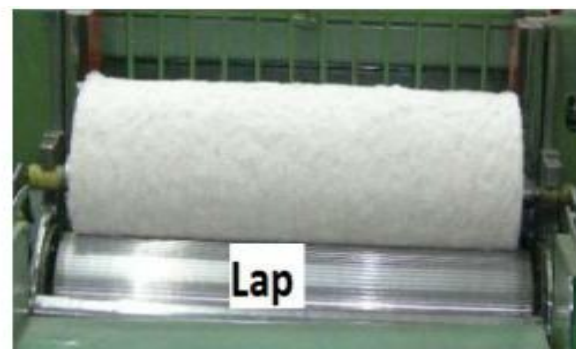
Sliver: The strand of loose, roughly parallel, untwisted fibers produced in Carding.

Roving: The soft strand of carded/combed fibers that has been twisted, attenuated, and freed of foreign matter, which is a feed material to spinning.

Yarn: A continuous strand of textile fibers that may be composed of endless filaments or shorter fibers twisted or otherwise held together.



Cotton Bales



Lap



Sliver Can



Lap for Comber



Fig Various Package Form:

2.2.2. Doffing the product

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.

2.3. Sorting waste

At the end of any operation cleaning the work area is very important to ensure the work environment is maintained in a safe and productive manner by applying kaizen and 5 S procedures.

- Collect the wastes at regular intervals as instructed by shift in charge
- Collect the waste from the centralised waste collection systems when it is full
- Collect the hard wastes from waste collection box
- Make sure that the fibre wastes are falling in respective waste collection bags.
- The rejected cops in the empties trolley should be segregated, cleaned and returned.
- Clean all the half cops and damaged cops in the particular shift itself.
- Ensure safety while carrying out cleaning activities.
- Clean the wastes in the alley around the spinning Machine area.
- Transport the wastes to the designated place
- Keep the waste category wise and avoid mix-up
- Transfer the wastes to waste godown & Weigh the wastes and record in register.

2.4. Clean the machines

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.

2.5. Machine Faults

Major machine faults are reported

Double ends High thin places

- Wrong count
- Contamination
- Piecing up
- False twisting
- Fault identification

Defects in spinning cops like uneven cops, slough off, stained bunch of yarn etc., are to be identified and informed to supervisor for necessary action.

- Defects in cones like irregular shaped cones, soft or hard cones, stitches formation in cones and Ribbon formation etc are to be identified and informed to supervisor for necessary action.

- Defects such as yarn shade variation, twist variation, stains etc. are also to be identified and informed to supervisor for necessary action.

Self check-2

Test-I Matching

Instruction: select the correct answer for the give choice.

Page 49 of 64	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1 August, 2022
---------------	--	----------------------------	----------------------------

A

- 1. Spinning
- 2. Blow room
- 3. carding
- 4. Draw frame
- 5. winding

B

- A. Twisting
- B. To make the fiber parallel more
- C. Opening, mixing, cleaning
- D. To make suitable package
- E. To individual the fiber

Test II: short Answer writing

Instruction: write short answer for the given question.

1. Write down about the operation of spinning machine
2. Write down at least three major machine faults?
3. What is the purpose of cleaning machine?
4. List some doffing and feeding material?

OPERATION SHEET-2

OPERATION TITLE: Operate spinning machine.

PURPOSE:

To train our trainees about the Operation and monitoring of spinning machine 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
2. Knot the sample yarn on the flyer
3. Knot the sliver on the sample yarn
4. Then twist the sliver by hand

Page 51 of 64	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1
			August, 2022

5. Start the the machine by press the pedal use your leg
6. Then monitor the sliver that pass properly to the flyer
7. Follow the steps for operation and monitoring machine operations
8. Follow standard operating procedures
9. Operate machines according to specification and manufacturer requirement.
9. clean the area and handle the waste 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 an operational problem checking again and if they completed pass to next learning out come.

LAP Test 2- 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.

Page 52 of 64	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1
			August, 2022

Task 1: Operate spinning machine according to the specification and product requirement

Task 2: Clean the area and Store waste by considering standard.

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

Unit Three: Complete spinning operation

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

- Doffing and replacing products
- House keeping
- Production records and other documentation

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:

- Products are doffing and replacing according to manufacturer specifications
- Products are unloading dispatching to next process
- Cleaning of area is completing to ensure work environment is maintained in a safe and productive manner
- Production records and other documentation are accurately completing

3.1.1. Doffing the product

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 would 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

3.1. Doffing and replacing products

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.

3.1.2. Products are unloaded and dispatched to next process

Workers loading and unloading materials should be instructed in safe procedures appropriate to the material they handle. Products are unladed or dispatch to the next process properly according to the standard. The application of proper material handling should be a mandatory while unload and dispatch post spinning products to the next process.

3.2. House keeping Management and keep up of facilities according to workplace procedures and standards.

- Implementing housekeeping activities
 - ✓ Cleaning schedule
 - ✓ 5s and OHS practices
 - ✓ Waste disposal
 - ✓ Regular inspection

Ergonomic arrangements of workplace

Ergonomics is a topic that affects us all; yet few of us have a good understanding of what the term actually means or realize how it affects us. Ergonomics is a science that focuses on designing a job for the worker. Ergonomically-designed job would ensure that a taller worker had enough space to safely perform his or her job, and also that a shorter worker could reach all of his or her tools and products without reaching beyond a comfortable and safe range. The opposite of this, and what typically happens in the workplace, is that a worker is forced to work within the confines of the job or workstation that is already existed.

Proper tools

Tools should be appropriate for the specific tasks being performed. Your tools should allow you to keep your hands and wrists straight the position they would be in if they were hang in relaxed at your side. The workers should bend the tool not the wrist. The tool should fit comfortably into your hand. If the grip size is too large or too small, it will be uncomfortable and will increase the risk of injury. Tools should not have sharp edges, create contact stresses in your hand, or vibrate.

Keep repetitive motion to minimum

Workstations or tasks can often be redesigned to reduce the number of repetitive motions that must be performed. Using a power-driven screwdriver or tools with a ratchet device can reduce the number of twisting motions with the arm. To prevent ergonomic injuries workers should be encouraged to rotate tasks or take frequent, short breaks to stretch and relax muscles.

Use safe lifting procedures

Avoid lifting objects that are too heavy. Use more than one person or a mechanical device to reduce the load. Your workstation should not require you to lift objects above your head or twist your back while lifting. Keep the load close to your body and ensure that you have a good grip. Heavy and frequently lifted objects should be stored between knee and shoulder height not on the ground or above your head.

3.3. Production records and other

Production records, i.e. once information on production progress is recorded it further automatically calculates stock of materials in process, recording of different process events and monitoring of production plans.

Traditionally, a company will have three, normally independent of each other, types of production records:

- Production records as records of production and transfer of of semi-finished products between spinning company units (parts and assembly units)
- Records of availability and issue of raw materials, materials, parts

- Records of labor and payroll for main direct labor and matching them with the output of products/semi-products/parts and assembly units

The primary production documents here are:

- Operations per part work output report containing retirement lines
- Transfer note
- Defects reporting and handling documents

The above documents are formed by the service upon running online registration of process events automatically.

The basic document of production records is output report, which combines several functions – both that of recoding operations per part work output, and materials/constituents used for output, and standard wages accounting, and costs accrual. This eliminates any possible discrepancies, doctoring and conflict of different accounting and reporting systems

Production records process shall start with the work output reports of blank production shops and followed on along the process route by machining and, ultimately, assembly departments.

- Parts and Assembly Units Transfer Notes are used to move them between the shops. Work with them is similar to work with Requisition Request for issue of materials and components.
- Once the process of recording of output of parts, minor components and their transfer to assembly facilities is up and running, we may proceed to running accounting in assembly shops themselves. Recording and posting of work output reports for all operations of the product manufacturing process route in the Clobber service will result in an finished product entry in the card file of the assembly department.
- The manufacturing process may not always run as it is supposed to. In this case a Reworking Report or a Scrap Report is drawn.
- Finished products and all things we are to ship to customers must be shifted to the finished products warehouse by creating the document Transfer of Products to Finished Products Warehouse.

Self-check-3.

Test II: short Answer writing

1. How we can doff and replace spinning machine product?
2. How we can Implementing housekeeping activities?
3. How can record production and other document?

OPERATION SHEET-3

OPERATION TITLE: Complete pre-spinning operation

PURPOSE: To train our trainees about the Complete pre-spinning operation 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:

Safety tools like glove, goggle safety boot, overall bale pucker machines, opener machines, blender machines, card machines, draw frame machines, lap former machines, comber machines, roving frame machines, spinning and other

PROCEDURE:

1. Apply OHS
2. Knot the sample yarn on the flyer
3. Knot the sliver on the sample yarn
4. Then twist the sliver by hand
5. Start the machine by press the pedal use your leg
6. Then monitor the sliver that pass properly to the flyer
7. Follow the steps for operation and monitoring machine operations

Page 59 of 64	Ministry of Labor and Skills Author/Copyright	Perform spinning operation	Version -1
			August, 2022

8. Follow standard operating procedures
10. Doff the product properly
11. clean the area and handle the waste properly
12. 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 operational of completing spinning operation can be checked by the trainers and trainees .If there is an operational problem checking again and if they completed the use pass to next learning out come.

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.Doff and replace products

Task 2 Unload and dispatch products to the next processes

Task 3 Complete cleaning and maintaining the work environment in a safe manner

Task 4 Keep Production records and documentation

Reference

1. Weisser, H. and Czapay, M., Fancy yarns market and production, Textile Praxis Int., 1228–1234, November 1981.
2. Hand Book of Textile Fibers, J. Gordon Clock, Volume I Natural Fibers, 1993 ,
3. Bellwood, L., Novelty yarns for specialty fabrics, Text. Indust., 63–68, January 1978.

4. Hand Book of Textile Fibers, J. Gordon Clock: Volume II: Man Made Fibers, 1993.
5. Laboratory Practice in the Study of Textile Materials, A. Koblyakov: 1989
6. TTLM of performing pre –spinning operations

Participants of this Module (training material) preparation

No	Name	Qualification (Level)	Field of Study	Organization/ Institution	Mobile number	E-mail
1	Abdrehman Hassen	B	Garment Enginring	WPTC	0910673126	Abdrehmanhassen39@gmail.com
2	Dawit Gebre	B	Textile Engineering	BuPTC	0920292380	dtexciv@gmail.com
3	Wubishet Tegegne	B	Textile Engineering	BaPTC	0918143343	wubu79@yahoo.com
4	Zemen Amha	B	Textile Engineering	GPTC	0918620373	Zemenamha123@gmail.com

