Basic Textile Operations

Level -I

Learning Guide -39

Unit of Competence: - perform spinning Operations

Module Title: - : **Performing Spinning Operations**

LG Code: **IND BTO1 M09 LO1-LG-39**

TTLM Code: **IND BTO1 TTLM 0919v1**

LO 1: Set up and load machine

Instruction Sheet	Learning Guide 39

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

- Checking product specifications
- Adjusting machine setting
- Loading input product
- Reporting non-conforming materials
- Keeping area clean

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Check Specifications To Identify Requirements For Production
- Adjust Machine Settings To Meet Product Requirements
- Load Product For Processing According To Manufacturer And Work Specifications
- Report Non-Conforming Materials
- Keep Clean Area Around Machine During Setting And Loading

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -.**
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Checking product specifications

1. Checking product specifications

Before start spinning process, specifications of product to be produced are checked

The following are product specifications of spinning:

- ✓ Count of yarn
- ✓ Twist per inch
- ✓ Twist direction
- ✓ Strength
- ✓ extension

1.1. Count

Count is a numerical value, which express the coarseness or fineness (diameter) of the yarn and also indicate the relationship between length and weight (the mass per unit length or the length per unit mass) of that yarn. Therefore, the concept of yarn count has been introduced which specifies a certain ratio of length to weight.

The fineness of the yarn is usually expressed in terms of its linear density or count. There are a number of systems and units for expressing yarn fineness. But they are classified as follows.

Types of Yarn Count:

1. Direct Count System

2. Indirect Count System

1. Direct Count System:

The weight of a fixed length of yarn is determined. The weight per unit length is the yarn count! The common features of all direct count systems are the length of yarn is fixed and the weight of yarn varies according to its fineness.

Tex system .....Number of grams per 1000 meters

Denier .....Number of Grams per 9000 meters

Tex system = mass in gram X 1000

Length in meter

Denier system = mass in gram X 9000

Length in meter

2. Indirect Count System:

The length of a fixed weight of yarn is measured. The length per unit weight is the yarn count. The common features of all indirect count systems are the weight of yarn is fixed and the Length of yarn varies according to its fineness. Indirect counting system may be expressed by Ne, Nm or others also.

1. Ne means: No of 840 yards yarn weighing in One pound

2. Nm means: No of one kilometer yarn weighing in One Kilogram.

The Ne indicates show many hanks of 840 yards length weigh one English pound. So that 32 Ne Means 32 hanks of 840yards i.e.32x840 yards length weigh one pound. For the determination of the count of yarn, it is necessary to determine the weight of a known length of the yarn.

1.2. **Twist**

Twist is the spiral arrangement of the fibers around the axis of the yarn. The twist binds the fibers together and also contributes to the strength of the yarn. The amount of twist inserted in a yarn defines the appearance and the strength of the yarn. The number of twists is referred to as turns per inch.

Principle of twist insertion systems:

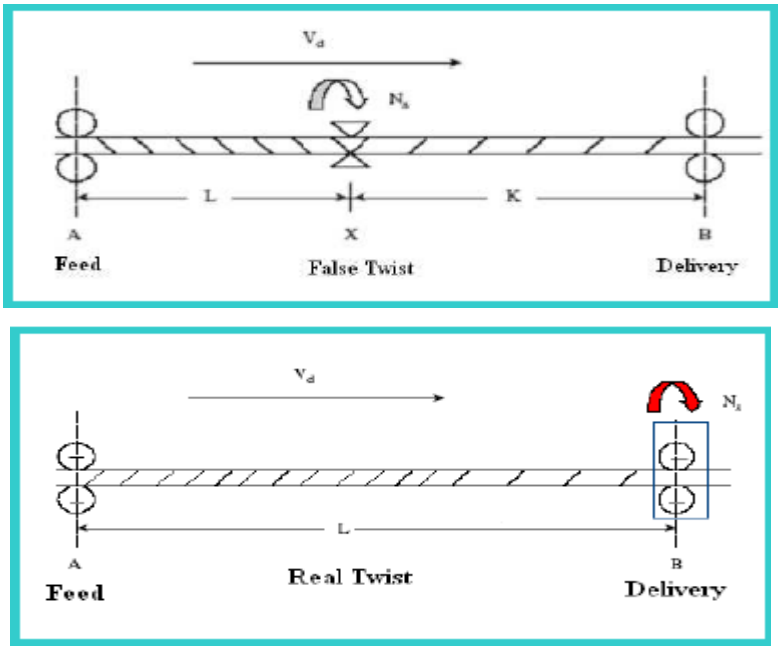

Fig 1.1: Twist insertion systems

1.3. Yarn Tension and Weight

During spinning, the output yarn will develop optimum tension and have standard weight.

Objectives of yarn Tension:

- Ensure well packed yarn structure
- Formation of stable balloon envelop
- Formation of firm package

For a given count of yarn, the tension is strongly dependent on the traveler speed and the balloon height.

1.4.1 Twist Direction

The direction of the twist at each stage of manufacture is indicated by the use of letters S or Z in accordance with the following convention: A single yarn has S twist if, it is held in the

vertical position, the fibers inclined to the axis of the yarn conform in the direction of the slope to the central portion of the letter S.

Fig 1.2. S-Twist

Similarly the yarn has Z twist if the fibers inclined to the axis of yarn conform in the direction of slope to the central portion of the letter Z.

Fig1.3. Z-Twist

1.4. **Strength**

This is defined as the breaking force of a spinning yarn and it is commonly measured in cN. Yarn strength is one of the most significant parameters to be controlled during yarn spinning process. This parameter strongly depends on both the rovings' characteristics and the spinning process.

Textile technicians are able to provide a raw and qualitative prediction of the yarn strength by knowing a series of fiber parameters like length, strength, and fineness. The assessment of such parameter is essential for obtaining high quality of the yarn. Nevertheless, they often need to perform many tests before producing a yarn with a desired strength.

1.5. **Yarn Extension**

During spinning the yarn must extended in a permitted range according to the company standards. If the yarn extended above the permitted range the yarn will be deteriorated & decrease in strength. In case of ring spinning, the ring frame loaded with roving sliver as

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Self-Check -1	**Written Test**

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

1. List down spinning product specifications (3 pts.)
2. _____ is measuring of thickness or thinness of yarn (2 pts.)
   A) Extension
   B) Twist
   C) Count
   D) none
3. Number of turns per length is _____ (2 pts.)
   A) twist
   B) count
   C) strength
   D) quality

Note: **Satisfactory rating – above 5 points** **Unsatisfactory - below 5points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

1. _____
   _____
   _____
   _____
   _____
   _____.
2. _____.
3. _____

Information Sheet-2	Adjusting machine setting according to product requirement

1.2 Adjusting machine setting according to product requirement

Considering various factors which are directly affected to the ring frame productivity, such as End breakage rate, Idle %, Doffing loss % and Pneumafill waste %. The project study is taken for 2 different counts – 9 combed wool and 24 carded count. For all trials, the Ring Frame machine (Zinser Model E-321) with a Speed of 9800 and 15500rpm is used respectively for both counts. The details of machinery parameter which are selected for study

Example Details of samples: -

Table 1.1 machine specification

Machine	**9 combed wool**	**24 carded count**
Carding	140 mts/min	100 mts/min
Ring frame No.	4	9
Count	9 combed wool	24 carded
Roving hank	0.4	0.6
Break draft	1.3	1.3
Spacer colour	Black	White
Spacer size	3.8mm	2.8mm
TM/TPI	4.0/14.4	4.0/20.58
Traveler no.	4 Bracker	2/0 Bracker
Traveler profile	U 1 CS UDR	C 1 MM UDR
Traveler clearer guage	3.3	2.3mm
Bottom roll setting	44/60mm	44/60mm
Saddle guage	48/58mm	48/58mm
Top arm loading color	Red	Red
Top arm loading weight(kgs)	15 Kgs	18 Kgs
Cops color	Violet	Mehendi

Cops length	230mm	230mm
Taper	1:40	1:40
Wharve diameter	20.5mm	20.5mm
Ring diameter	44mm	42mm
Ring type	R&F	Bracker Titan
Chase length	42mm	46mm
Winding length	4.5mm	4.5mm
Pitch of the yarn	**3.46mm**	**3.46mm**
No. of spindles	1136	1136
Lift	205mm	205mm
Bobbin length	230mm	230mm
Spindle guage	70mm	70mm
Spindle tape drive	Tangential Belt drive	Tangential Belt drive

Self-Check -2	**Written Test**

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

1. Discuss the importance of adjusting machine setting before production (5 pts.)
2. Write down at least 10 machinery parameters to be checked before production. (5 pts.)

Note: **Satisfactory rating – above 7 points** **Unsatisfactory - below 7points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____
   _____
   _____
   _____
   _____.
2. _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

Information Sheet-3	Loading input product

3. Loading input product

Creeling:

Roving is fed to the Ring frame from roving bobbin held by creels. For all the spindles roving bobbin are creeled on the machine. The roving is guided and passed through trumpet. The roving then passes through the drafting rollers.

Fig.1.4. creeling

fig.1.6. Loading sliver

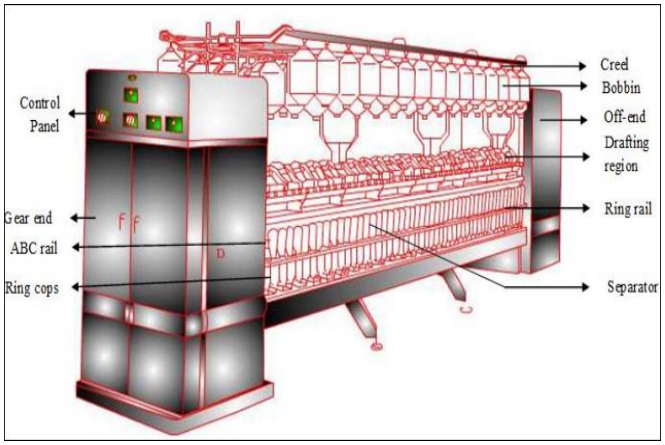

Fig.1.5. creeling

Information Sheet-4	Reporting non-conforming materials

1. Adjusting machine setting according to product requirement

Definition of Non-Conforming Material Report

Non-conforming material report is shown here in detail. Any item, part or product with one or more characteristics which depart from the requirements in the specification ,safety ,legality, regularity & quality or other approved product description.

Nonconformity refers to a failure to comply with requirement .A requirement is a need, expectation, or obligation; it can be stated or implied by an organization, its customer, or other interested parties. There are many types of requirement .some of these include quality requirement ,customer requirement management requirement ,product requirement and legal requirement .whenever any organization fails to meet one of these requirement ,nonconformity occurs.

PURPOSE / IMPORTANCE OF NON - CONFIRMING MATERIAL / PRODUCT

1. Strong controls of non - conforming materials reduce risk of receiving product that is not compliant or that does not meet quality expectation.
2. It is the policy to ensure procedure are in place to identify: segregate and dispose of **Non-Conforming Material Report** related to safety, legality or quality in a systematic manner and to establish corrective action with the goal of preventing future reoccurrence.
3. The purpose of this procedure is to describe how Non -confirming material, components, partial assemblies & final product are controlled.

Non- Confirming Material Control System.

Every quality Assurance program addresses the non conforming material report system. This system prevents defective material from being processed, consumed or shipped. When documenting this system consider these processes.

1. Receiving inspection
2. Process Defects
3. Product defect
4. Finished goods containment
5. Returned material
6. In process product specific containment

IMPLEMENTATION

Spinning department verified documents of all incoming materials by conduction several in-house visual, manual inspections &tests with limited tools & aid to validate materials conformity per client's requirement of the quality standard & requirement of safety ,rules, bans & regulation & register the data.

Declaration by the Management

Suspect product may be identified by anyone in the spinning department. during any stage in the process,

1. Receiving good inspection
2. In- process inspection
3. End line inspection process.
4. Pre final inspection process.
5. Yarn returns.

Suspect Product Is Segregated From Other Product Identified With.

A. **Hold Tag**; for suspect, damage and nonconforming product and for next weaving or knitting process

B**.** **Rejected Tag**: for kill garment and nonconforming product, **Authority and responsibility**
Management has nominated review team GMP/OAM/Head Of lE./, for inspect non-conforming material report and product, the team only has the right to dispose the Non-confirming materials/products and this process must meet customer requirement.

All production OE/ring station such as yarn inspection .sliver inspection, production operator, finish product inside and outside inspection,. And final inspection must have authority to identify product do not meet buyer/next step process quality expectation which is given by the management, (you can keep defect sample for ref,)

Location Of Non - Conforming Material/Product

Management has been decided a place to keep the non-conforming material report / products at department wise stores/Cutting/sewing/finishing with proper locked and record. All department box only can open as per OAM supervision. And make the record.

Store.
Trims inspection time found all reject item will keep in side read box with record style wise, the box will open one moth one time with quality manager, if necessary b/4 one month open box store manager must inform to QAM .and O, AM is the Authorize person open box. All reject item will return to supplier.

Feeding sliver

After check sliver, remove defects, If not sliver defect, remove sliver defect will keep in this feeding .will open one moth one time only. If necessary b/4 one month open read spinning manager must inform to QAM .and QAM is the Authorize person allow process. All reject panels will record and send to non-conforming room,

On the processing/spinning

In line process or end process if any defect found can rectify same time will highlight hanging over quality system with defect cord for operator, operator will rectify and return to checker, if any kill spinning will keep in red box with record, will open one month one time only. If necessary any case QAM Authorize person open box. All reject yarns will send to non-conforming room.
Also non-conforming material report label we have plastic container at respective work station, if any label found as reject operator must put in to plastic container and inform supervisor accordingly. Supervisor will be responsible for update his register and replace label through the store department.

Finishing

In process and end process if any defect found if can rectify same time operator will rectify and if any kill spinning will keep in the red box with record for GMP/QAM/FM/ review whatever can repair will do and balance after record qty send to non-conforming stores. This process we doing every day. And also same time GMP call a meeting for all

Department in charge and managers discuss daily kill yarn qty and %. And point out where having issue and how can control the issue,

Documentation of the Nonconforming Product

1. The nonconformity details in the documentation must including buyer name/style no/ date And quantity.
2. Description of the nonconformity; need to mention the description of the nonconformance How and why they are non- conformity and the quality
3. Labeling of the nonconformity: product defect .finished non-conformity yarns. And returned Non-conforming material need to be labeled as non-conforming segregated away from the confirming material.

The documentation is the first step for a later corrective action process. The first level of documentation is primary information gathered about the nonconformity. Customer's/next step process complaints are considered as nonconformities. The documenting shall include evidence of the result caused by nonconforming product-why and how does it fail to meet the requirements, due bellow detail ring documentation of the non-confirming product bellow detail are to be recorded.

4. Investigation: any non-conformity must be followed with an investigation .the purpose of The investigation is to identify the root cause for the nonconformity; this is the essences of the corrective action.
5. Documentation regarding status of the product is required as well.
1. Repair or rework

2. Acceptance or rejection,
3. Corrective action required- the product must be submitted to corrective action process.

In every stage the non-confirming material/product must be documented and it is reviewed by the managements and related Department manages the inspection/defect report or record has to be keep for future reference and for supplier evaluation purpose.

Basic Idea about Control of Non-Confirming Material/Product

Factory employee need to know the control of non-conforming material report material and its procedure so that they can implement in the factory. Management has taken idea to aware the employee about control of non - confirming material/product;

1. Awareness to the employee through general meeting
2. Posted the main things of the non-confirming material/product in the floor and also each Department.
3. Training to the quality responsible person who maintaining non-confirming Materials/product record in the related area.
4. Must need to provide the basic information about SOP of non-confirming material
5. Inform the employee that management empowered them to identify the non-confirming Material/product. All the stage and area.
6. Need training to the related person who they can understand the material is the Nonconforming.

Procedure Non - Confirming Material/Products

Below are the three stages to control non confirming materials, in process goods and finish goods

1. Identify
2. Segregate
3. Disposition

IDENTIFY

1. All production QC station such as fabric inspection .trims inspection ,cutting ,embroidery and printing inspection ,cut panel inspection, sewing in -line inspection production operator, finish product inside and outside inspection, finishing end line inspection, ironing process. And final inspection have the authority to identify product which do not meet buyer quality expectation,
2. Once these good are identified ,these should be clearly marked, separated and details has to be logging in the non-conforming materials register.(12345) these good need to be keep in the department specific designated non-conforming material box. Each department boxes are controlled by a designated responsible person.
3. This should be reported to the department manager,

SEGREGATE

1. Once such raw material, in process goods and finish good are identified which do not meet buyer quality expectation. These should be segregated from the ok goods right away and should be kept in a separate designated area non conforming materials.
2. All concerned person/department should strictly follow and make sure these identified good not mix-up with ok good.
3. One these non-conforming material are full or after a specific time these non-conforming good along with report need to hand over to central non-conforming material zone.
4. This central non-conforming material report zone is restricted area, a list of authorize person who are eligible to work in this room should have clearly mentioned.

DISPOSITION

1. Factory will not rework any raw material (trims, accessories and fabric) which is identified defective, so there is no scope of raw material re- work. This has be clearly reported and inform to the next step process.
2. This inspection defect report has to be kept for future reference and for supplier evaluation.
3. Factory can re- work defective parts or yarns ,in such case all these good has to be re Inspection,
4. After style finish reconciliation these identified raw-materials and finish goods.
5. Will sand the sample of defect and Email to the -merchandiser for replacement,
6. Finish good destroy these reject following buyer requirement and local law/environmental law.

Standard Operation Procedure for Customer Notification.

Purpose

To avoid the issues regarding safety, regulatory and quality requirement of the product when changing the Material, Components, design or Manufacturing process.

Procedure

Materials changing

Weaving or knitting manager must be closely work with sample department and R & D department to understand feasibility of producing yarns with process approval materials.

If R & D department highlight issues of materials with proper evidence weaving/knitting will be responsible for update process accordingly. If knitting/weaving manager agreed to change materials with proper investigation as per the new materials will be proceed the production materials accordingly.

Components.

This will be defend on production feasibility or achieve maximum required quality level. If original sample or sketch having any components which is not really helpful for production/quality after discussion with production! IE, sample department head will update weaving/knitting accordingly.

Weaving/knitting must me share these issue's with process for further approval.

Conclusion

This also will depend on production feasibility or achieve maximum required quality level. Sample. Department head! Production head and lE will discuss together and will be finalizing best manufacturing process. Secondly sample head will make one Pcs mock sample with all changers which is discussed along with respective heads without changing process approval design. After completing of sample will be share with respective weaving/knitting manager for forward it to process with clear understanding. If next process agreed with vender proposal after receiving of new design sample will proceed with changers. If not will follow previous original design given by knitting/weaving for non-conforming material report

Self-Check -4	**Written Test**

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

1. Which of the following is non-conforming material? (2pts.)
   A) Uneven count
   B) Lint cotton
   C) S-twist
   D) yarn
2. Write down at least four non-conforming material of spinning process. (4 pts.)

Note: **Satisfactory rating -___points** **Unsatisfactory - below ___ points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____.
2. _____
   _____
   _____
   _____
   _____
   _____
   _____

Information Sheet-5	**Keeping area clean**

Cleaning of Ring frame & dust disposal:

- Carry out cleaning of machine at periodic intervals as instructed.
- Clean the creeling area at periodical intervals & keep the creeling zone free from fluff & dust accumulation.
- Use the cleaning equipment given to clean the drafting Zone.
- Periodically arrange to clean the top roll clearer roller (Scavenger Roller).
- Ensure that the clearer roller is always kept clean.
- If there is any over lapping noticed, remove the roller lapping manually or with tools provided, without damaging the cots. Clean pneumatic pipes and ensure that the suction Orifices are free from fluff accumulation.
- Collect the roving wastes and yarn waste in the hip bag provided and deposit them. Category wise in the designated bags at specified places.
- Clean around the Ring frame machine using proper cleaning equipments.
- Keep the Ring frame department clean.
- Check the cleanliness of the work place

Self-Check –5	Written Test

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

1. Discuss how to make spinning machine clean? (4 pts.)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

_____

_____

_____

_____

_____

_____.