

BASIC TEXTILE OPERATIONS

NTQF Level -1

Learning Guide -37

Unit of Competence: Perform Pre-Spinning operations

Module Title: Performing Pre-Spinning operations

LG Code: IND BTO1 M10 LO3-LG-37

TTLM Code: IND BTO1TTLM 0919v1

LO3: Checking lap and sliver quality



Instruction Sheet

Learning Guide #37

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

- Performing pre spinning operation
- Checking produced lap & sliver
- Assessing non-conformances and sliver faults:
- Rectifying or reporting slivers faults

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:**

- ❖ Perform pre spinning operation producing lap and sliver
- ❖ Check produced lap & sliver against quality standards
- ❖ Assess sliver for faults and non-conformances
- ❖ Rectify or report faulty slivers

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 19.
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.
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.
7. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
8. Accomplish the “Self-check 2”.



9. 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 2).
10. If you earned a satisfactory evaluation proceed to “Information Sheet 3”. However, if your rating is unsatisfactory, see your teacher for further instructions.
11. Read the information written in the “Information Sheets 3”. And Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3”.
13. 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 3).
14. If you earned a satisfactory evaluation proceed to “information sheet 4”. However, if your rating is unsatisfactory, see your teacher for further instructions
15. Read the “information sheet 4” and try to understand the procedures discussed.
16. Accomplish the “Self-check 4”.
17. 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 4).
18. If you earned a satisfactory evaluation proceed to “operation sheet”. However, if your rating is unsatisfactory, see your teacher for further instructions
19. Accomplish “operation sheet 1”.



Information Sheet-1	perform pre spinning operation
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Pre-spinning operation is the activities performed before spinning in general, so includes activities performed in Blow room machines, Carding machine, Draw frame machine or Integrated Draw frame machine, Combing machine , Roving frame machine.

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List operations in pre spinning operations. (6 points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____



Information Sheet-2

check produced lap & sliver

2.1. Checking produced lap & sliver

Produced lap or sliver is checked against the pre-determined standard. Example: Even sliver thickness, even sliver weight and etc.

2.1.1. Defects and Causes in blow room

- Neps formation
- Curly cotton due to tight gauge
- Lap clicking

i. Causes of neps formation in blow room

Due to following points neps formation takes place. And these nep formations strongly affect the yarn quality

- Because of too high or low moisture of cotton.
- Neps formation takes place when there is extremely fine cotton with high trash content.
- Reprocessing of laps and mixing of soft waste cotton, if the reprocessing, this will create bad effect of Yarn quality. During reprocessing maximum neps are create which are difficult to remove in the next stage. So it is needed to avoid reprocessing of laps and soft waste cotton.

ii. Causes of curly cotton

Due to following points of curly cotton it should be set the parts of machine in a proper way so that following causes does not happen

- Grid bar is the part of blow room machine which is used for cleaning purpose. Grid bar settings are very close to the beater.
- Causes of curly cotton are due to hooked or bent pins in beaters.

iii. Causes of Lap Licking

Due to the following points lap clicking occurs. Lap is the output of blow room which is used for next step such as carding machine. To avoid the lap of licking we use roving ends within the lap to act as a layer separation.

- Soft waste cotton should not use in mixing because it will create problem in the next stage.
- Sticky nature of cotton, so avoid sticky cotton.



2.1.2. Preventive Action

i. Preventive Action for Neps Formation

- For avoiding neps formation it is necessary to select the cotton according to moisture content in the cotton. In both cases if moisture content is less or more, our process will become critical.
- As quality of our end product depends upon raw material. If cotton having more trash content then it is necessary to increase beating point. And this beating will directly affect our neps formation and neps formation will be more.
- Cotton mixing supervisor should take action that during mixing soft waste and process lap not to be mix with fresh mixing. This step is necessary to avoid neps formation. As neps formation affect the quality of our yarn.

ii. Preventive action for curly cotton

- For getting good quality product it is necessary to keep trained staff for maintenance point of view.

There is a need of technical person who have full grip on their work. They should check the setting of machine and to keep machine update to avoid the problems. Machine setting must not be wide not so close to avoid curly cotton problem.

iii. Preventive action for lap licking

- In order to prevent from lap licking it is necessary not to mix soft waste during mixing process.
- Avoid sticky nature cotton as in case sticky nature cotton then as a preventive action inside temperature of department is to be controlled. In this case low relative humidity and high temperature is needed.

2.1.3. Defects in Carding and Causes

- Causes of high sliver variation.
- Nep formation
- Holes or patches in card web
- High sliver variation in due to difference in draft between card
- Worn clothing and feed roller bearing also create variation in card sliver.
- If auto leveler is not working properly than this will also create high sliver variation.
- If auto leveler is off then check the wrapping of carding after every 30 minutes.

i. Causes for Neps Formation

- Insufficient stripping



- Dirty under casing (grid bar)
- Uneven flats setting
- Under casing chocked with fly (waste)
- High roller speed

ii. Causes for Holes or Patches in Card web

- Poor flat stripping
- Hooked or damaged wires on flats
- Damaged cylinder
- Cluster of cotton embedded on cylinder wires

2.1.4. Preventive Action

- In order to avoid sliver variation draft calculation should be correct. Testing of sliver must be on time at least 3 times during shift.
- High sliver variation problem may also be due to maintenance problem. So concentrate on maintenance. If our maintenance of machine will be there, then it will get more efficiency and better quality will be achieved. If expiry time of some part of the machine is there, then on time it must be replaced.
- Now a days in advance technology the cards, auto leveler are electronic which adjust the sliver weight automatically. For getting better result with automatic auto leveler, it is also necessary to check sliver weight manually as well.

i. Preventive action for NEP formation

- Over hauling of machine must be on time. During over hauling, setting of every part of the machine has to be checked. Flat setting play very important role for reducing nep formation. So flat setting must not be uneven.
- Suction waste point should be properly working. This point must not be chocked. If there will be chock then neps formation will take place. Suction waste point also to be checked manually as well.
- This problem is also related to maintenance. Over hauling of every machine must be on time. Wire of flats and cylinder have specific time limit of production. After that specific time limit it must be changed. As these play very important role by quality point of view.



2.1.5. Causes of draw frame sliver variation

These are the following point which affects the variation in draw frame

- Break draft.
- Improper handling of material.
- Over filling of can with material.
- Top roller overlapping.
- Thick piecing of sliver when sliver is break.
- Improper working of auto leveler.

2.1.6. Preventive action of Frame sliver variation

- To avoid sliver variation it should be concentrated on break draft. For cotton processing break draft is normally from 1.16 to 1.2 because if improper break draft is given, it will affect the quality of yarn in the form of thick and thin places.
- Production department supervisor should cover draw frame material with polythene sheet to avoid fine dust otherwise it will create variation in the sliver. Fresh material is to be given to the next process, if fresh material not use then it will create variation in the sliver.
- Draw frame material is very sensitive and it must not over fill. In case it compresses the material in the can, and it raptures the surface of sliver. So production supervisor should be strictly avoiding this.
- Top roller cleaning is to be done after every 1 hour. In this way variation will be decreased in the sliver.

2.1.7. Defects and causes in roving

Following are the defects and causes in roving:

- Roving tension
- Improper handling of material
- Improper piecing in roving
- Roving breakage

2.1.8. Preventive action

i. Preventive action for roving tension

Roving tension is directly related to machine. The roving tension depends upon delivery rate and the difference between flyer speed and bobbin. For preventive action we should keep the delivery length and the speed difference constant then the tension in this case will be ideal.



ii. Preventive action for improper handling of material

Roving material is very sensitive regarding to quality point of view. It is necessary to take care of material. The material should be handled in such a way that fine dust must not affect the material. It must be avoided touching because of its sensitivity. Fresh material should be used for next process. This material should not be kept for long time. If it will be kept for long time then it will create variation. C.V% increases if material is not used.

- Supervisor must treat its worker in a proper way so that handling of material should be according to policy of mill.

iii. Preventive action for improper piecing in roving

Supervisor should train his workers in a proper way. If end breakage is disturbed then its treatment should be proper. If piecing will not be proper then it will affect the next process.

iv. Preventive action for roving breakage

This problem is caused due to maintenance problem. Maintenance required machine stoppage but it is against the production. To enhance the quality of product, the machine maintenance is the chief requirement. For the proper solution of roving breakage, speed of machine, trained operator and proper management should be must otherwise it create sever problems in ring section.

Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss the defects of lap.(3 points)
2. Discuss the defects of sliver.(3 points)



Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____

2. _____



Information Sheet-3

Assessing non-conformances

3.1. Nonconformity: the nonfulfillment of a specified requirement

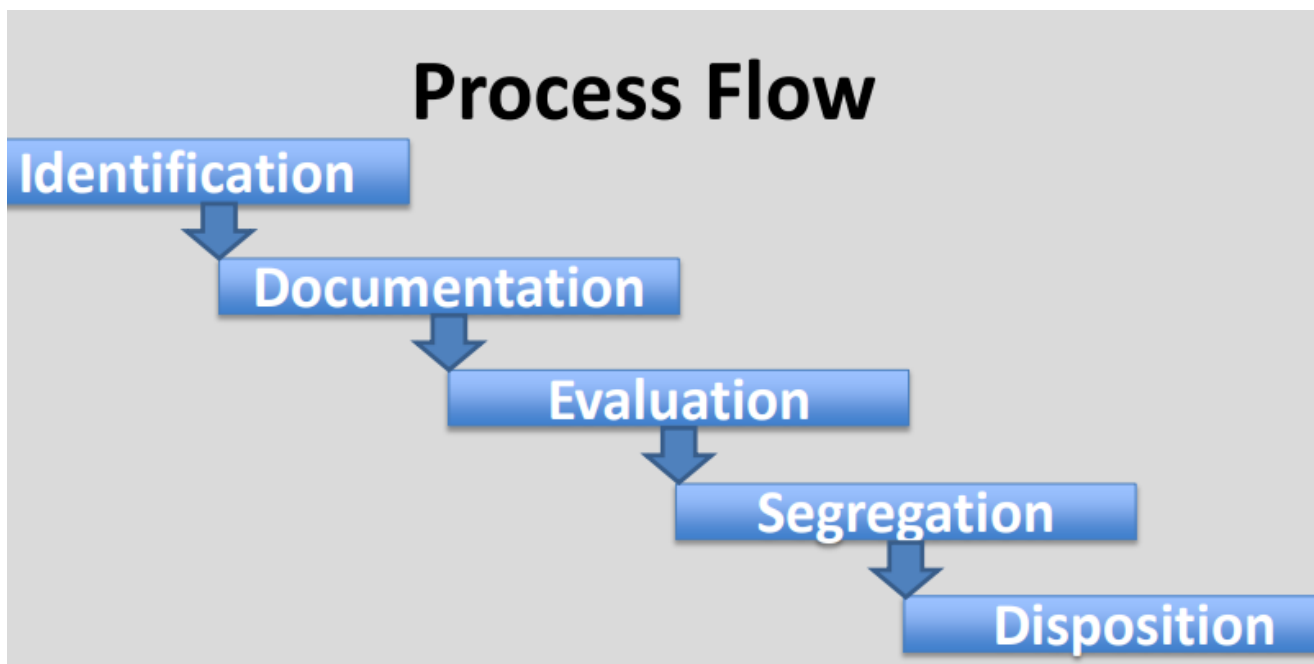
3.2. Non- conformances

- ✓ Nonconforming Product is product that does not fulfill its specified requirements
- ✓ Nonconformance's can occur in both product and process
- ✓ Nonconforming processes can lead to nonconforming product.

3.3. Nonconforming Product - Regulation

“Each manufacturer shall establish and maintain procedures to control product that does not conform to specified requirements....”

“....The procedures shall address the identification, documentation, evaluation, segregation, and disposition of nonconforming product.”



3.3.1. Identification

Sources of Nonconforming Product

- Received components/material that fail incoming inspection

Example

- ✓ Specification: 6 +/- 1 inch
- ✓ Inspection result: 8 inch
- ✓ This is nonconforming product

- Products/components that fail inspection or test during manufacturing

Example



- ✓ Temperature range: $300 \pm 10^{\circ}$ F
- ✓ Temperature set on bonding machine: 280° F
- ✓ This is nonconforming process:

- Product returned to manufacturer with defects

Example

- ✓ If a catheter is supposed to fit inside a 6 French guide and during procedure it does not fit.
- ✓ Handled within the complaint system*
- ✓ *not within the scope of this talk

3.3.2. Documentation

- Form that identifies the material, the problem, evaluation, segregation, the investigation (if any), disposition and signatures
- Standard operating procedure (SOP)
- Work Instruction (WI)

3.3.3. Evaluation

... The evaluation of nonconformance shall include a determination of the need for an investigation and notification of the persons or organizations responsible for the nonconformance. The evaluation and any investigation shall be documented.

5.3.4. Segregation

You must segregate non-conforming product to ensure it is not released.

Examples

- ✓ Locked Cages
- ✓ Digital Controls
- ✓ Separate Area

3.3.4. Disposition

Each manufacturer shall establish and maintain procedures that define the responsibility for review and the authority for the disposition of nonconforming product. The procedures shall set forth the review and disposition process.

Typical Nonconforming Product in Dispositions

- Scrap
 - ✓ Where you decide not to use the product
 - ✓ destroy
- Downgrade
 - ✓ Reverting back to a safe and effective older version when there is a problem with an upgrade



• Use as Is

- ✓ Use the Nonconformance as is when it does not affect the safety and effectiveness of the final product

• Rework

Each manufacturer shall establish and maintain procedures for rework, to include retesting and reevaluation of the nonconforming product after rework to ensure that the product meets its current approved specifications.

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss the non-conformances of materials. (3 points)
2. Write the process flow of non-conformances of materials. (3 points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____

2. _____



Information Sheet-4	Rectifying or reporting slivers faults
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4.1. Lap and Sliver fault

Lap and sliver faults are resulted from:

- ❖ Improper pressure of top roller due to defective parts or defect in weighting system.
- ❖ Wrong settings, improper roller coverings and eccentric top and bottom rollers.

Evenness of the sliver can be improved with closer nip to nip distances in the short-term range, but too close drafting distances could also result to more fiber damage; thus, optimum settings have to be found for a given set of fiber parameters.

4.1.1. Uneven Lap

High unevenness of lap can lead to bobbin count variation.

4.1.2. Wrong Count

Wrong count of sliver leads to more end breakage rate during spinning, weaving and knitting.

4.1.3. Contamination

Contamination is unnecessary impurity which will reduce the quality of sliver and lap produced.

4.1.4. Piecing Defect

Wrong piecing defects leads to more sliver breakage. So the size of knot performed by operator must meet the pre-determined knot size.

Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

2. Discuss the quality parameters of sliver.(3 points)
3. What are the causes of Lap and sliver faults? (3 points)



Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____

2. _____



List of Reference Materials

- 1- Analysis on the Defects in Yarn Manufacturing Process & its Prevention in Textile Industry by Neha Gupta
- 2- Training Programme 2004– Spinning by P.N.R. Jeevananthan
- 3- Klein, W. Short-staple Spinning Series, The Textile Institute, Manual of Textile Technology, Volumes 1, 3, 4, & 5,1994.
- 4- Wynne, A. The Motivate Series, Textiles, 1997.
- 5- Bukayev, P.T. General Technology of Cotton Manufacturing, 1984, Mir Publishers.
- 6- Cotton: Science and technology Edited by S. Gordon and Y-L. Hsieh