BASIC TEXTILE OPERATION

NTQF Level -I-

Learning Guide -89

Unit of Competence: Package Finished Textiles

Module Title: Packaging Finished Textiles

LG Code: **IND BTO1 M23 LO2-LG-89**

TTLM Code: **IND BTO1 M23 TTLM 09 19v1**

LO2: Complete inspection, Packaging or folding tasks

Instruction Sheet	Learning Guide #-89

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

- Conducting machine operation processes
- Recording fabric inspecting and faults
- Grading the inspecting fabric according to the standard
- Folding and packing inspecting fabric
- Assessing the work according to the quality

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:

- Conduct machine operation processes
- Record fabric inspecting and faults
- Grading the inspecting fabric according to the standard
- Fold and pack inspecting fabric
- Assesses the work according to the quality

Learning Instructions:

1. Read the specific objectives of this Learning Guide **- 89-**
2. Follow the instructions described in number on page **–2-**
3. Read the information written in the “Information Sheets 1”, sheet 2, Sheet 3, sheet 4. and sheet 5 on page, 3, 8, 15, 27 and 27 respectively
4. Accomplish the “Self-check 1”, Self –check 2, Self –check 3, Self- check 4 and Self-check 5 **on page 6, 12, 18, 27 and 29** respectively
5. Ask from your **trainer’s** the key to correction (key answers) or you can request your **trainer’s** to correct your work.
6. If you earned a satisfactory evaluation proceed to **“Information Sheet**”. However, if your rating is unsatisfactory, see your **trainer’s** 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	Conduct machine operation processes

1.1. Introduction

Turning is a form of machining, a material removal process, which is used to create rotational parts by cutting away unwanted material. The turning process requires a turning machine or lathe, work piece, fixture, and cutting tool. The work piece is a piece of pre-shaped material that is secured to the fixture, which itself is attached to the turning machine, and allowed to rotate at high speeds. The cutter is typically a single-point cutting tool that is also secured in the machine, although some operations make use of multi-point tools. The cutting tool feeds into the rotating work piece and cuts away material in the form of small chips to create the desired shape.

Turning is used to produce rotational, parts that have many features, such as holes, grooves, threads, tapers, various diameter steps, and even contoured surfaces. Parts that are fabricated completely through turning often include components that are used in limited quantities, perhaps for prototypes, such as custom designed shafts and fasteners. Turning is also commonly used as a secondary process to add or refine features on parts that were manufactured using a different process. Due to the high tolerances and surface finishes that turning can offer, it is ideal for adding precision rotational features to a part whose basic shape has already been formed.

The time required to produce a given quantity of parts includes the initial setup time and the cycle time for each part. The setup time is composed of the time to setup the turning machine, plan the tool movements (whether performed manually or by machine), and install the fixture device into the turning machine. The cycle time can be divided into the following four times.

1.1.1. Load/Unload time

The time required to load the work piece into the turning machine and secure it to the fixture, as well as the time to unload the finished part. The load time can depend on the size, weight, and complexity of the work piece, as well as the type of fixture.

1.1.2. Cut time

The time required for the cutting tool to make all the necessary cuts in the work piece for each operation. The cut time for any given operation is calculated by dividing the total cut length for that operation by the feed rate, which is the speed of the tool relative to the work piece.

1.1.3. Idle time

Also referred to as non-productive time, this is the time required for any tasks that occur during the process cycle that do not engage the work piece and therefore remove material. This idle time includes the tool approaching and retracting from the work piece, tool movements between features, adjusting machine settings, and changing tools.

1.1.4. Tool replacement time

The time required to replace a tool that has exceeded its lifetime and therefore become to worn to cut effectively. This time is typically not performed in every cycle, but rather only after the lifetime of the tool has been reached. In determining the cycle time, the tool replacement time is adjusted for the production of a single part by multiplying by the frequency of a tool replacement, which is the cut time divided by the tool lifetime.

Following the turning process cycle, there is no post processing that is required. However, secondary processes may be used to improve the surface finish of the part if it is required. The scrap material, in the form of small material chips cut from the work piece, is propelled away from the work piece by the motion of the cutting tool and the spraying of lubricant. Therefore, no process cycle step is required to remove the scrap material, which can be collected and discarded after the production

1.2. Operations

During the process cycle, a variety of operations may be performed to the work piece to yield the desired part shape. These operations may be classified as external or internal. External operations modify the outer diameter of the work piece, while internal operations modify the inner diameter. The following operations are each defined by the type of cutter used and the path of that cutter to remove material from the work piece.

1.3. Cost derivers

The material cost is determined by the quantity of material stock that is required and the unit price of that stock. The amount of stock is determined by the work piece size, stock size, method of cutting the stock, and the production quantity. The unit price of the material stock is affected by the material and the work piece shape. Also, any cost attributed to cutting the work pieces from the stock also contributes to the total material cost.

1.4. Production cost

The production cost is a result of the total production time and the hourly rate. The production time includes the setup time, load time, cut time, idle time, and tool replacement time. Decreasing any of these time components will reduce cost. The setup time and load time are dependent upon the skill of the operator. The cut time, however, is dependent upon many factors that affect the cut length and feed rate. The cut length can be shortened by

optimizing the number of operations that are required and reducing the feature size if possible. The feed rate is affected by the operation type, work piece material, tool material, tool size, and various cutting parameters such as the radial depth of cut. Lastly, the tool replacement time is a direct result of the number of tool replacements which is discussed regarding the tooling cost.

1.5. Tooling cost

The tooling cost for machining is determined by the total number of cutting tools required and the unit price for each tool. The quantity of tools depends upon the number of unique tools required by the various operations to be performed and the amount of wear that each of those tools experience. If the tool wear exceeds the lifetime of a tool, then a replacement tool must be purchased. The lifetime of a tool is dependent upon the tool material, cutting parameters such as cutting speed, and the total cut time. The unit price of a tool is affected by the tool type, size, and material.

1.6. Operational Benefits:

a. Automates the order fulfillment process to increase productivity and reduce costs
b. Modular and customizable components provide for flexible configurations and expansion for growth
c. Easy to use operating system simplifies job changeovers
d. Stabilizes and reduces labor requirements for both on- and off-peak seasons
e. Multi-point verification ensures accuracy in single or multiple item orders

Self-Check -1	Written Test

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

1. What is the difference between Load and Unload? (8 Points)
2. What is the difference between Tool cost and production cost? (10 Points)

Note: **Satisfactory rating - 16 and above points** **Unsatisfactory - below 16 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ----------

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2. ----------

Information Sheet-2	Record fabric inspecting and faults

2.1. Fabric Inspection

Inspection in reference to the apparel industry can be defined as the visual examination or review of raw materials (like fabric, sewing threads, buttons, trims, etc), partially finished components of the garments and completely finished garments in relation to some standards. The main objective of inspection is the detection of the defects as early as possible in the manufacturing process so that time and money are not wasted later on in either correcting the defect or writing off defective garments

Fabric is the main raw material for garments manufacturing process. Therefore, fabric inspection is a very important task in the garment industry. Fabric inspection focuses on fault/defect rate, shade, end to end & edge to middle shading, handle and appearance. Now I would like to discuss about the method of fabric inspection and 4 point system

Fabric inspection focuses on fault/defect rate color, end to end and edge to middle shading, hand/handle, and appearance. The client will select the appropriate fault rate and standard to determine the acceptance of each shipment. This will minimize the quantity of panels or garments rejected for fabric faults, thereby ensuring the quality of the finished goods

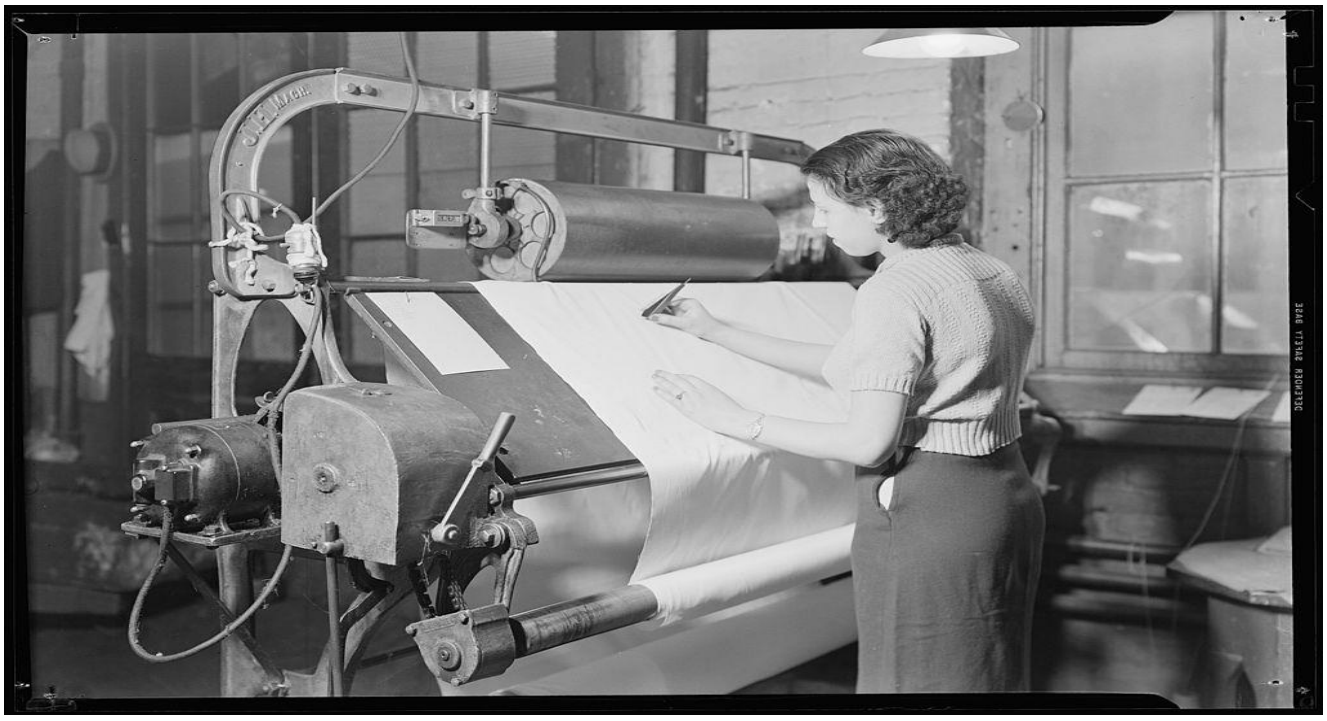

Fig. Fabric inspection

2.2. Purpose of fabric inspection

Fabric Inspection is an important aspect followed prior to garment manufacturing to avoid rejects due to fabric quality and facing with unexpected loss in manufacturing. Fabric inspection is done for fault/defect rate, fabric construction, end to end or edge to edge shading, color, hand or feel, length/width, print defect and appearance. Fabric inspection ensures to minimize the rejection of cut panels or rejected garments due to fabric faults. Cutting inspected and approved fabric ensures not only finished garment quality but also reduces rejects, improves efficiency and timely deliveries.

The purpose of fabric inspection is to determine the quality and acceptability for garments. As fabric is received, it should be inspected to determine acceptability from a quality viewpoint. Some garment manufacturers rely on their fabric suppliers to perform fabric inspection and fabric defects. In many small companies, spreading and cutting is done by the same personnel and fabric is inspected as it is being spread on a table for cutting. Fabric inspection, mapping or marking defects is important prior to spreading and cutting because:

- Spreading can be done more quickly because the spreader is not also inspecting the fabric.
- A cutter's productivity will increase because the defects are already marked.
- The patterns are cut around the defects so as not to include them in the finished garment

2.3. Method of Fabric Inspection

1. Select the rolls to inspect
2. Both fabric manufacturer and garment manufacturers' inspector to have an approved fabric submission form to compare bulk to bulk.
3. Put the rolls on the inspection machine or viewing device.
4. In order to assess shade continuity please refer to Best Practice for Shade Continuities
5. Inspect for visual defects with the light on at a speed slow enough to find the defects. (The fabric must be checked at a slow rate in order to effectively find flaws). Sometimes inspector may have to turn the light off to see how a flaw will affect the appearance of a garment.
6. **Check for skewed, biased, and bowed fabric**.
   - Woven Fabrics: maximum 3%
   - Knitted Fabrics: maximum 5%

2.4. Fabric inspection machines

Fabric inspection is usually done on fabric inspection machine. These machines are designed so that rolls of fabric can be mounted behind the inspection table under adequate light and rerolled as they leave the table. Defects can be seen readily with these machines, as the inspector has a very good view of the fabric and the fabric need not be reversed to detect defects. These machines are power driven or the inspector pulls the fabric over the inspection table.

The defects are located, marked and recorded on an inspection form. These machines are also equipped to accurately measure the length of each roll of fabric as well as monitor the width of the fabric. The variation in width of fabric can result in a higher cost of manufacturing for basic garments since profit margin for these garment manufacturers is usually lower than that for fashion garment manufacturers and therefore, maximum fabric utilization is vital.

2.5. Fabric Inspection Documentation

To ensure proper documentation of the Inspection report the following should be correctly recorded.

- Mill Name
- Fabric P.O. Number
- Mill / Supplier roll number
- Roll length
  - Ticketed
  - Actual
  - Difference between ticketed and actual
- Recorded cut table width
  - 1st Measurement: At the start of the roll at least 2 meters or yards into the roll
  - 2nd Measurement: In the middle of the roll
  - 3rd Measurement: At the end of the roll at least 2 meters or yards before the end
- Number of defect points per roll by 4 point system
- Defect result calculated by a roll in points/ 100 Sq Yards/Meters
- Inspector comments if any per roll

2.6. General Inspection Procedures

a. Fabric inspection is done in suitable and safe environment with enough ventilation and proper lighting.
b. Fabric passing through the inspection frame must be between 45 - 60 degree angles to inspector and must be done on appropriate Cool White light above viewing area. Back light can be used as and when needed.

c. Fabric speed on inspection machine must not be more than 15 yards per minute.
d. All fabric inspection must be done when 80% of good or lot is received.
e. Standard approved bulk dye lot standards for all approved lots must be available prior to inspection.
f. Approved standard of bulk dye lot must be available before starting inspection for assessing color, hand, weight, construction, finish and visual appearance.
g. Shade continuity within a roll by checking shade variation between centre and selvage and the beginning, middle and end of each roll must be evaluated and documented.
h. Textiles like knits must be evaluated for weight against standard approved weight.
i. Fabric width must be checked from selvage to selvage against standard.
j. All defects must be flagged during inspection.
k. The length of each roll inspected must be compared to length as mentioned on supplier ticketed tag and any deviation must be documented and reported to mill for additional replacement to avoid shortage.
l. If yard dyed or printed fabrics are being inspected the repeat measurement must be done from beginning, middle and end of selected rolls

Self-Check -2	**Written Test**

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

1. What is meant by fabric inspection? (3 Points)
2. What meant by fabric inspection machines (4 points)
3. What are the method of Fabric Inspection (9 points)

Note: **Satisfactory rating - 12 and above points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Grade the inspecting fabric according to the standard

3.1. Introduction

Visual Inspection and Grading of Fabrics In trade relationships between sellers of fabrics and their customers, a system of defect analysis or defect grading must be agreed upon and

in use. At the core of any grading system is simplicity and accuracy. The system must be clearly stated and easy to execute. Of various systems used worldwide, the "4-poinr and "10-poinf' systems are the most common.

The actual method used in any relationship must be agreed upon by all parties as the standard. This discussion will cover these grading methods in a very fundamental manner, and these discussions should not be automatically adopted as a standard method. Various world standards organizations such as ASTM should be referred to for an actual standard method. Defect Classifications (Major/Minor Defects) Defects have been classified as "Major or Minor" defects and by category. These classifications are based upon the judgment and experience of fabric graders. It must be conceded that all "point table" defects do not result in the determination of product {end item) seconds.

Further, it must be understood that certain small or minor defects may be acceptable in certain areas of an end item (garment or home product) while being unacceptable in others, and that a large percent of small or minor defects are lost in the cutting and fabricating of end items. For these reasons, it seems logical that the quality of a fabric, represented by a point value, should be more reliable and correlative to end item quality and fabric utilization if these facts are taken into account.

It is known that across the industry almost all conditions exist, so that a minor defect to one end use may be a major to another and vice versa, but if the nature of the fabric and the demands of an end use are understood, there should be little problem relating quality determined by the major/minor concept.

The definitions against which these defects have been classified are as follows: Major/minor defects defined: Major- A defect severe enough, if exposed, to place an end item in seconds. It must be understood that certain small or minor defects may be acceptable in certain areas of an end item (garment or home product) while being unacceptable in others, and that a large percent of small or minor defects are lost in the cutting and fabricating of end items.

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The definitions against which these defects have been classified are as follows: Major/minor defects defined: Major- A defect severe enough, if exposed, to place an end

item in seconds. Minor -An imperfection that may or may not cause a second, depending upon its location in the end item and/or its chance of being lost in fabrication. In many agreements, a major defect may be severe enough that it carries a connotation of "critical /H

. This means that this defect by itself would cause an entire roll to be rated as a second or worse. Where applicable, the purchaser and the supplier may agree upon the classification, location, maximum size of a fabric characteristic, and frequency of occurrence that shall not be counted as a defect. In any case, the purchaser and the supplier must agree on a list of defects to be used in grading fabric as well as their severity. The total shipment shall be rejected if the sample inspected exceeds the maximum acceptable defect level mutually agreed upon by the purchaser and supplier.

Defect Category Classification: Defects have been placed into categories based upon their similarity of appearance and effect upon visual quality, and general utilization of the fabric. For example, all defects that result in a fine vertical line are classified within a category. As a result of defect grouping, the use of these general classifications can serve to simplify inspection reports and still render useful information. Definitions of categories are as follows:

a. A narrow or fine-lined length or warp wise defect of a continuous or lengthy nature.
b. A narrow or fine-lined width or filling wise defect.
c. Isolated defects, such as general unevenness, nep, fuzz balls, oil spots, and color fly, knots, slubs, etc.
d. Pattern defects such as miss-selection of pattern, color miss- draw, broken color pattern, improper cover, etc
e. Finishing defects.
f. Printing defects.

It is important to remember that the number of points assigned to a specific defect will tend to further establish its size and nature.

- I**nspection**: Rolls or bolts of fabric are visually inspected and individually graded at an examination station using an agreed upon point system. Inspect and grade the total length of each roll or bolt sampled. Fabrics shall be inspected full width and are passed longitudinally through the inspection area at a visual inspection speed. Fabric may be stopped to grade when necessary to affirm marginal defects and for defects flagging (marking).
- All defects visible at normal inspection speed and distance of one yard or one meter shall be counted. Fabric is normally inspected and graded on one side only.

Certain types of end use fabrics may be inspected and graded on both sides as agreed upon between the purchaser and supplier. Detect and assign points to defects observed as agreed upon by all parties. Assign points to the defects based upon their length within the plane of the fabric according to one of the following options of assigning points, as agreed upon between the purchaser and the supplier

- **Apparatus**: It is recommended that a suitable fabric inspection machine that provides a flat viewing area and a variable speed controlled fabric rewind with forward and reverse. Direct overhead lighting should be provided.
- . **Lighting**: The overhead direct lighting source shall be mounted parallel to the viewing surface to illuminate with direct perpendicular impinging light rays The lighting source should be cool white preheat rapid start fluorescent lamps having a correlated color temperature of 4100 to 4500 K with white reflectors and without baffles or glues, or other source by agreement between the purchaser and supplier
- **Back lighting** (transmitted) light may be used if agreed upon by the parties involved. Typically, backlighting would apply to only particular types of fabric. Conditioning: Conditioning is not required. Sampling: (recommendations) With shipments which total1000 yards (meters) or less, inspect and grade the total number of rolls or bolts. For shipments exceeding 1000 yards (meters), select samples as agreed upon by the purchaser and supplier
- **Typically,** 10% of the rolls or bolts are inspected. If there are less than the allowable points for each 100 yards inspected, then this is an acceptable level. If more than the allowable points are found, then the roll is unacceptable. If 20% of the rolls inspected are defective, then the entire lot of rolls should be inspected. For example, a lot of 100 rolls of 100 yards each is inspected using a 4-point system. Ten rolls (10% of total) are selected for inspection

3.2. Inspection

Inspection can be defined, in the apparel industry, as the visual examination or review of raw materials (such as fabric, Buttons, Zippers, Sewing threads, Trims, etc), partially finished components of the garments and completely finished garments in relation to some standards, specifications or requirements, as well as measuring the garments if they meet the required measurements. For inspection, to be effective, the entire inspection loop must be completed.

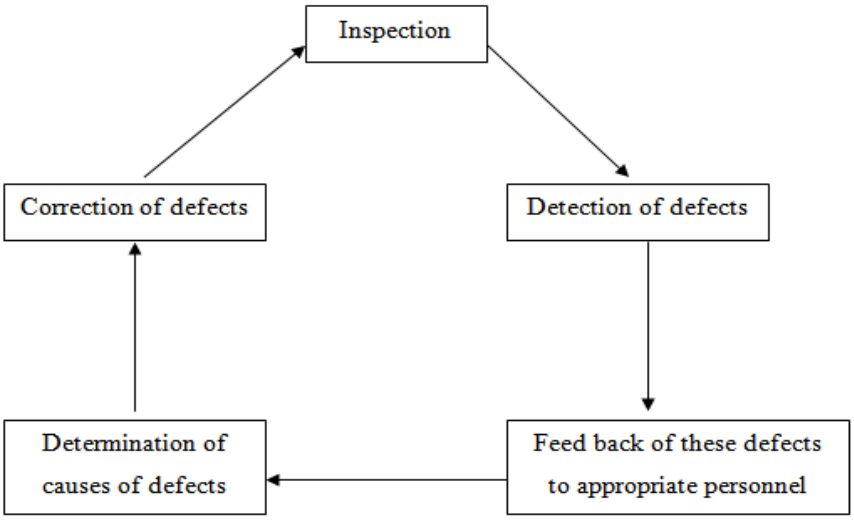

Fig. Garments inspect flow chart

3.3. General Information of fabric inspection

- ❖ The general rules for inspection are mentioned below:
- ❖ There is no standard viewing condition for inspection fabrics.
- ❖ The acceptable limit for first quality fabric is usually estimated by mutual agreement between the buyer and seller.
- ❖ To determine defects, most systems suggest a 3 feet viewing distance.
- ❖ There is no standard sampling plans used in the industries for the inspection of fabric.

3.4. Steps in garments inspection:

In garments industry, the desired or expected quality parameters are controlled by inspection. This inspection can be done in three steps:

1. Raw material inspection in garments industry
2. In process inspection in garment industry
3. Final inspection in garment industry

Self-Check -3	Written Test

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

1. What is meant by visual Inspection and grading of fabrics? (6 Points)
2. Put inspect flow chart in the knitting and weaving processes? (8 points)

Note: **Satisfactory rating – 12 and above points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ----------

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2. ----------

Information Sheet-4	Fold and pack inspected fabric

4.1. Introduction

This is a textile machinery works as fabric folders used in textile factory or textile mills. This machine is specially designed primarily for the folding of fabric and textile design. Clothes folding machine is mainly used for folding cloth. These clothes folding machines are easy in operation and perform smoothly without noise. Cloth folding machines are easy to use, robust construction, low maintenance, durable and reliable and Long service life. It also used for home textile for making textile fabrics. Clothes folding machine is used after Compactor Machine

4.2. Function of Cloth Folding Machine

Function of cloth folding machine in textile factory is given here-

- This cloth folding machine is working as fabric folders in Textile Company as well as in home textile,
- Doubling, lapping, measuring the fabrics with inlet from plait or loose fabrics, rolls or batchers as well as for outlet,
- Foot switch is used for withdraw the finished fabrics to send the empty sword plate in home textile as well as in textile industry,
- Hard or loose folding feature, due to torque controlled by industrial machinery

4.3. Working Process of Folding Department in Textile Industry

The main function of folding department is fabric inspection and then dispatching. This is the department where the quality of the finished product is checked, i.e. whether it satisfies the customer requirement or not. This department consists of inspection, grouping, packaging and dispatch.

4.4. Flow path of folding department in textile industry

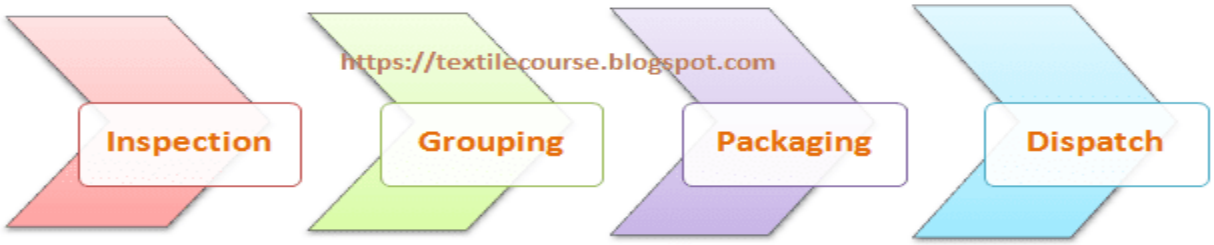

Fig. : Process flow of folding department

4.5. Inspection:

In inspection the operator check the processing faults (like weaving faults, dyeing faults, printing faults and finishing faults).

4.3.1 Major faults are:

- Double Pick
- Thick pick
- Stain mark
- Oily weft
- Crease mark
- Drop stitches
- Jerk in
- Miss print
- Out print
- Shade variation ,etc

4.6. Inspection and folding

The main function of this department is fabric folding or rolling of fabric .This is the department where the quality of the raw material and the finished product is checked .This department consist of testing, inspection & folding. Fabric is so obtained is inspected and packed for selling purpose .It involves 5 steps

a. Inspection
b. Grading
c. Cutting plan
d. Packing
e. Faults observed

4.7. Inspecting system:

4.7.1. Four point inspection system: In this inspecting system the checkers give points to the fault, according to the fault length.

- 0-3 inches damage is considered as 1 point
- 3-6 inches damage is considered as 2 point
- 6-9 inches damage is considered as 3 point
- 9-12 inches damage is considered as 4 point

4.7.2. In every 100 meter of checking:

- If the total point is below 23 points then the fabric is acceptable (for expert buyers).

- If the total point is below 28 points then the fabric is acceptable (for domestic buyers).
- Cut able defect- Hole, stoppage, stich, stain, droppings.
- And if continuous damage comes regularly then the fabric is cut out from the batch.

4.7.3. Methods of inspection:

- Lumb
- Folding inspection

4.7.4. Lumb or table inspection:

- This method is used only for domestic buyers.
- 150 -200 m of fabric is folded and then taken for table inspection.
- Here also the checkers follow the 4 point system for inspection.

4.7.5. Folding inspection:

- Machine speed: 10-20 m/min

4.7.6. Procedure:

- The roller is fed to the inspecting machine.
- Fabric through the guide roller comes to the inspecting zone, here the checker check the fabric at a speed of 10-20 m/min.
- And the fabric wrap on the batch. A meter is connected on the inspecting table to measure the length of the fabric.
- Every 100-120 meter fabric passes the checker cut the top and bottom (10 cm of fabric) and compares them for checking the shade variation of the fabric for domestic market.
- For export buyers, every 250-300 meter fabric passes; the checker cut the top and bottom of the fabric (10-20 meter of fabric) and compares them to check the shade variation
- Top is sent for grouping and bottom is sent to QA department for checking the CSV

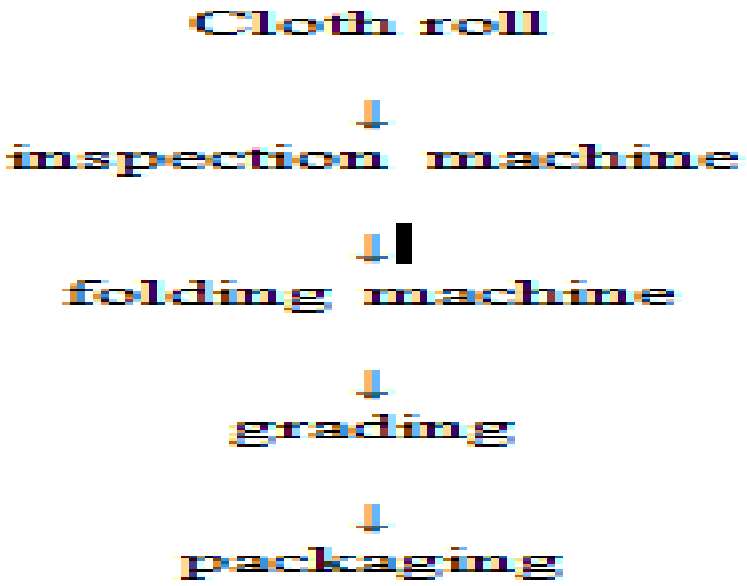

Fig. procedure of folding

4.8. Garments Finishing:

Garment finishing is very important because buyer's satisfaction depends on it. Garments finishing means, mainly applies of pressing, folding & packing of garments. In this article I will explain steps of garments finishing process with pictures.

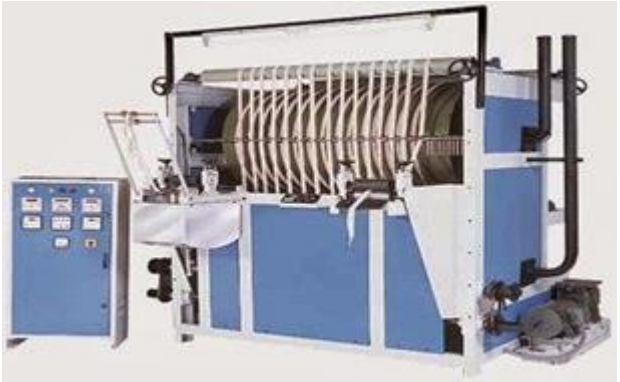

Fig. Garments finishing m/c

4.8.1. Pressing: is a finishing process done by a cloth to heat and pressure with or without steam to remove creases and to impart a flat appearance to the cloth or garments. In garment industries pressing is also called ironing. After completing pressing the garments have to be folded.

Fig. Pressing

4.8.2. Folding: After completing pressing, the garments are folded with a predetermine area. Garments are folded according to the buyers direction, requirements in a standard area

4.8.3. Packing: After folding, garments are packing the size of polythene packet is permanent. Specially, it is needed to ensure the placement of sticker in proper place

Fig. Packing systems

Self-Check -4	Written Test

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

1. What is the main function of folding machine? (6 points)
2. What are the procedure of folding? (8 points)

Note: **Satisfactory rating – 12 and above points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ----------

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2. ----------

Information Sheet-5	Assesses the work according to the quality

5.1. Introduction

Quality management (QM) is the portion or section of the overall management function that determines and implements the quality policy. Quality is the collective features and characteristics of a product or service that reflects on its ability to satisfy stated or implied needs of the client.

5.2. Quality is fitness for purpose for the intended end use or customer.

Quality management requires a system of evaluations that may or may not require product testing to be carried out. In most cases involving textile products, some form of physical or chemical testing and evaluation will be required to determine conformance or noncompliance.

5.3. What does testing involve?

There is a wide range of test types available so you must be aware of the reason you are testing and for what purpose the test results will be used. The testing method must be determined before beginning the sampling and testing to ensure that the results are useable for all parties concerned. The test method or work instructions need to be documented.

5.3.1. Selecting the most appropriate test method

It is important to know exactly what you are trying to measure or verify and the reason why you are measuring it. Testing may be carried out for one of the following purposes:

- quality control – for example, testing raw materials, finished product, appraisal testing
- quality assurance – testing samples on the run to allow changes to be made to improve the quality or confirm conformance of the product during or prior to production
- conformance – testing to show compliance with a specification or performance criteria

5.4. Quality assurance (QA) testing

QA tests are designed to ensure a manufactured product conforms to the specification. It is carried out prior to the next process. It may involve testing the raw material or ingoing material or testing at any part of the production or supply pipeline that allows for a nonconforming product to be isolated or modified to meet the required specification.

5.5. Quality control (QC) testing

QC testing is appraisal testing, which occurs after the product has been completed. It usually involves testing for compliance with a specification or customer requirements. Normally, if the product fails QC testing there is nothing that can be done to gain conformance to the specification. It is normally a pass/fail test.

5.6. Specifications

- It is important that all of the requirements of a specification are fully understood and agreed upon by all parties prior to entering into a contract.
- The specification usually involves the product's composition, required physical properties, and actual test methods to be used to determine each of the required properties and the specification requirements or pass/fail criteria.
- After a specification has been agreed upon there is no point in debating the nonconformance of a particular requirement as being too demanding to be met. These discussions need to be clarified prior to accepting a specification. Failure to do so can be a very costly experience.
- Specifications may be written for a particular product or end use or may be generic in nature, such as The Wool mark Specifications or Australian Garment Mark, or they may be very specific for a particular fabric for a specialized end use.

5.7. Who produces test methods?

There is a wide range of test methods being produced throughout the world. Each standardization body produces test methods applicable to their environment and conditions of use. The test methods are usually put together with the cooperation of a large group of technical experts specializing in the particular field. The proposed test method is then normally distributed to a wide user audience for comment. Once all of the comments are received and considered, the final test method is produce

Self-Check -5	Written Test

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

1. What is meant by specifications? (5 Points)
2. What is meant by quality is fitness (5 Points)

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

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ----------

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2. ----------

List of Reference Materials

1. Celik O, Ucar N and Ertugrul S (2005): Determination of Spirality in Knitted Fabrics by Image Analysis, Fibers and Textiles in Eastern Europe, Vol 13, pp 47-49.
2. www.textileschool.com/School/Apparel/ApparelManufacturing/FabricInspection.aspx.
3. De Araujo M, Catarino A and Hong H (1999): Process Control for Total Quality in Circular Knitting, AUTEX Research Journal, Vol 1, pp 21-29.
4. Hemdan A A T and Ayatallah M S (2008): Online Fabric Defect Detection and Full Control in Circular Knitting Machine, AUTEX Research Journal, Vol 8, pp 21-29.
5. Garments Manufacturing Technology by Md. Saiful Azom