Textile Chemical Processing

NTQF Level - II

Learning Guides#21

Unit of Competence: Apply Finishing Processes to Textile production

Module Title: Applying Finishing Processes to Textile production

LG Code: IND CHP2 M07 L01-LG21

TTLM Code: IND CHP2 TTLM7 0919v1

LO1: Set up and load finishing machine or equipment

Instruction Sheet	Learning Guide #21

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

1.1 Confirming finishing processes for textile products
- 1.1.1 Beveling
- 1.1.2 Brushing
- 1.1.3 Coating
- 1.1.4 Cropping
- 1.1.5 Crushing
- 1.1.6 Cutting
- 1.1.7 Decatising
- 1.1.8 Decoclaving
- 1.1.9 Fire retardant treatment
- 1.1.10 Laminating
- 1.1.11 Mending
- 1.1.12 Milling
- 1.1.13 Padding
- 1.1.14 Pressing
- 1.1.15 Printing
- 1.1.16 Raising
- 1.1.17 Rolling
- 1.1.18 Scouring
- 1.1.19 Shearing
- 1.1.20 Singeing
- 1.1.21 Stabilizing
- 1.1.22 Tumbling
- 1.1.23 Washing

1.2 Textile products
- 1.2.1 Woven or knitted fabric
- 1.2.2 Woven or knitted carpet
- 1.2.3 Non-woven textile product

1.3 Checking textile product quality

1.4 Reporting non-conforming materials

1.5 Loading textile product

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 –

- ❖ Confirm Finishing processes required for textile product.
- ❖ Check Textile product quality and conformity to specifications.
- ❖ Report Non-conforming materials.
- ❖ Load Textile product into finishing machine or prepared for manual finishing.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described.
3. Read the information written in the “Information Sheets 1-4”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1-4.
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).
6. If you earned a satisfactory evaluation proceed to “Information Sheet ”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity .
7. Submit your accomplished Self-check. This will form part of your training portfolio

Information Sheet-1	Confirming finishing processes for textile products

Introduction

What is textile finishing?

Dyeing and printing are not the ultimate steps .Something is required to make the fabric more suitable for end-use .Quality of the fabric in terms of appearance, handle, functionally enhanced by some physical means or by chemicals ,Therefore, ultimate value addition is done to the fabric by finishing

- Finishing is a final process given to a textile material to
  - Give a good appearance
  - Desirable feel
  - Impart certain durable properties
    - Stiffness
    - Softness
    - Wash and wear finish
    - Water repelling finish
    - Fire proof finish etc.
  - To impart some desired functional properties

Confirmed finishing processes for textile products are:

1.1 Beveling

A bevel is the inclined shape that needs to be formed on one or both sides of the plate. If you consider a section of a plate, then the shape BEFORE bevelling and shape AFTER bevelling look as follows:

Before

After

1.2 Brushing

Brushing is a finishing process used to raise the surface fibers of a fabric. The fabric undergoes a mechanical brushing process in which fine, metal brushes carefully rub the fabric to produce fine fibers from the woven yarns, creating extra softness on the surface of the fabric.

The purpose of brushing/seeding is to remove the short and loose fibers from the surface of the cloth. It also removes husk particles clinging to the cloth. Brushing is mainly done to fabrics of staple fiber content, as filament yams usually do not have loose fiber ends. Cylinders covered with fine bristles rotate over the fabric, pick up loose fibers, and pull them away by either gravity or vacuum. The raised fiber ends are cut off during shearing operation. Brushing before cropping minimizes pilling.

1.3 Coating

Coating is an application of an appropriate chemical system to form a layer of a coating compound on the substrate. Coating is a process in which a polymeric layer is applied directly on one or both the surfaces of the fabric. Depending upon the end-use, heavy-duty technical textile, coatings may be applied. Unlike woven textile materials now coating is being done on other textile substrates also such as warp-knitted, weft-knitted and nonwovens.

Coating formulations;-Formulation contain a wide range of chemicals¬ depending upon :

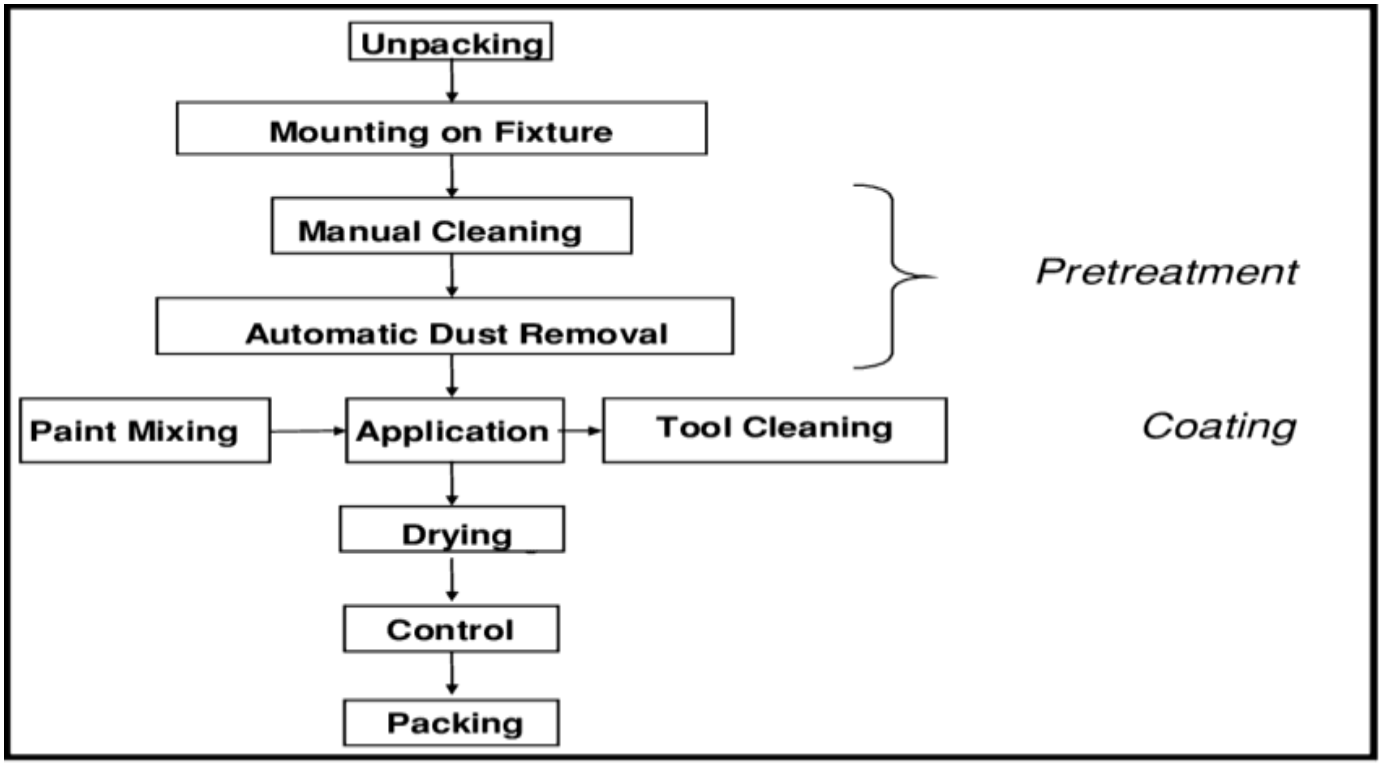
- Nature of polymer
- Necessary additives for the specific end-use.
- Whether coating has to be foamed prior to application.
- Type of coating machinery to be used

Polymer used for coating

- Polyvinyl chloride (PVC)
- Polyvynilidene chloride♣ (PVDC)
- Polyurethane (PU)♣
- Acrylic♣
- Ethylene vinyl acetate♣ (EVA)
- Poly tetra fluoro ethylene♣ (PTFE)
- Natural rubber (NR)♣
- Silicone♣

SUBSTRATE; - A wide range of textile materials is used as substrates for coated fabrics. Woven, Knitted, Nonwoven materials, Cotton, Rayon, Nylon, Polyester and blends such as of polyester with cotton or rayon are used as substrate. Polyester is the most popular in staple form for nonwoven material and also in spun form for woven material. Polypropylene is emerging as the fiber of choice because of its low specific gravity, strength properties, chemically inert nature and low cost. Functional coatings may be applied to change the surface properties of the substrate, such as adhesion, wet ability, corrosion resistance, or wear resistance..

Coating machine



Coating flow chart diagram

1.4 Cropping

Objectives of Cropping

- To remove protruding fibers from theꟷ surface of fabric
- To give clean and smoother appearanceꟷ to the fabric.
- To control pill formation
- Designing can also be done by thisꟷ method (partial raised effect)

Advantages of cropping

- It increases flame retardancy of fabric,ϖ
- small fiber at surface of fabric attract fire easily
- Increase aesthetic properties likeϖ smoothness , luster etc
- In cropping process no threat of fabricϖ
- destruction present on occasion of power shutdown or machine stoppage
- It is cheaper and simple
- It can also produce even hairy effectϖ
- which can not be produced in singeing machine

How it works?

There are several helical blades are arranged in series, Fabric pass beneath these blades. Direction of blade motion is opposite to the direction of fabric motion. There is another vertical blade called ledger, place beneath the fabric which shear the other side.

1.5 Crushing

This crushing technique is enduring process, though it might well be said as at least half permanent and can be refreshed after washing. We use two types of crushing, and down the length of the dress and random pleating are the two forms. We use improved apparatus for crushing cloth, such as velvet or other pile type fabric. We carry out the crushing by relentlessly pulling lengths of the cloth into an elongated treatment chamber to form random creases therein. During the process, the cloth is stuffed further

fabric crushing machine

Crushed fabric

1.6 Cutting

is the preproduction process of separating (sectioning, carving, severing) a spread into garment parts that are the precise size and shape of the pattern pieces on a marker. Cutting often is carried out in two stages: rough cutting (separating the individual pieces) and the final cutting (accurate cutting of the individual shapes).

Different Types of Fabric Cutting Machine:

According to the operating process, the Cutting Machine can be classified into three types.

Such as-

1. Manual
2. Semi- Automatic
3. Automatic / Computerized

1) **Manual Cutting Machine:**

- Hand Scissors

2) **Semi-Automatic Cutting Machine**:

- Straight knife of Cutting Machine.

3) **Computerized Cutting Machine**:

- Knife Cutting Machine

This methods provides the most accurate possible cutting, at high speed,.

Some Other Computerized Cutting machines are as follows

- Air jet Cutting Machine.
- Ultrasonic Cutting Machine.
- Plasma Torch cutting Machine

1.7 Decatising

The aim of decatising (also known as blowing, open blowing or decating) is to stabilize the properties of a wool fabric developed in finishing; including the luster and handle achieved in pressing. It produces a smooth, wrinkle-free finish and lofty handle in woollen and worsted fabrics and in wool blends with man-made fibers.

This process is mainly carried out on wool by exploiting its elastic properties in hot and wet conditions by the direct action of the steam on the fabric. This treatment gives the processed fabric the following characteristics:

1) Dimensional stability

2) Setting of pile after raising

3) Reduction of possible glazing effect after calendaring

4) modification of the hand, which is much more consistent after the treatment;

5) Pre-stabilization to autoclave dyeing

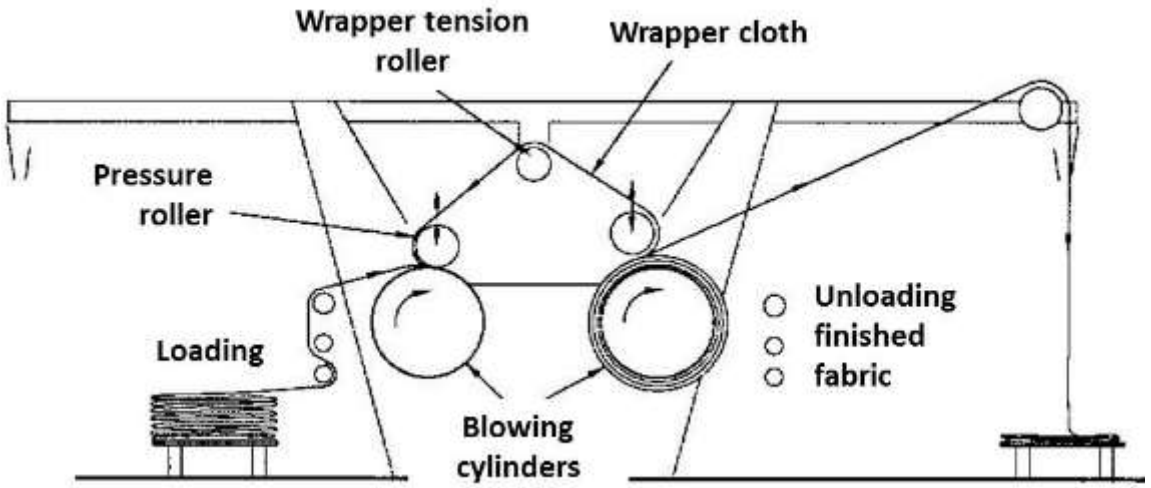


Figure shows a diagram of a traditional batch decatise

1.8 Fire retardant treatment

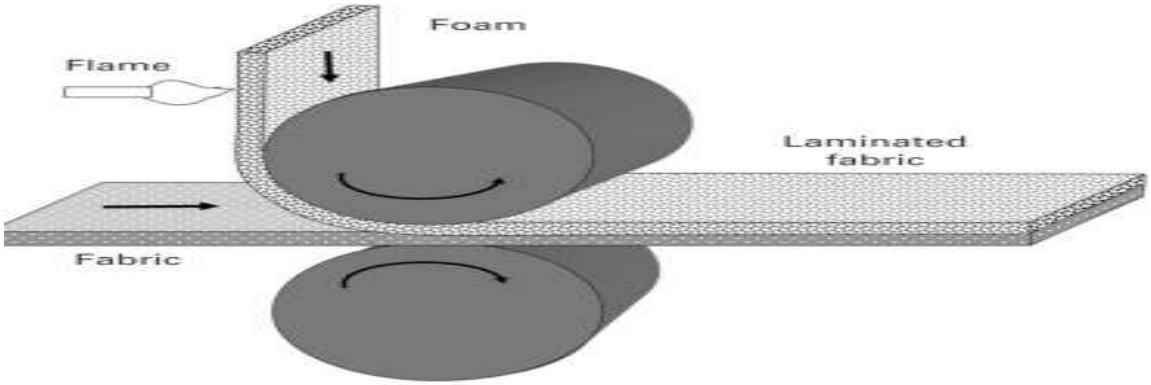
Flame-retardant finishes provide textiles with an important performance characteristic. Protection of consumers from unsafe apparel is only one area where flame retardancy is needed. Firefighters and emergency personnel require protection from flames as they go about their duties. Floor coverings, upholstery and drapery also need protection, especially when used in public buildings. The military and the airline industry have multiple needs for flame-retardant textiles.

1.9 Laminating

Lamination, in technology, the process of building up successive layers of a substance, such as wood or textiles, and bonding them with resin to form a finished product.

Lamination is a processing approach to producing a composite system with improved strength, stability and appearance by using two or more materials stacked in multiple layers. Wide ranges of materials are known to laminate to each other, and the process is continued until the laminate has the desired properties. Finally, the laminate is permanently assembled by heat, pressure, welding or adhesives. Technological advancement in the field of lamination has led to different ways in which sheet can be laminated. Hot-roll lamination,

extrusion lamination, flame lamination and adhesive lamination are a few such processing approaches.



Laminating machine

Lamination defects

A common problem with laminated fabrics is 'cracking', which is caused when one or both materials joined are not stretchy enough to allow the laminate to be curved in an arc. Use of an excessive amount of adhesive or too much foam burnt off in flame lamination may cause cracking. The suitability of fabrics for lamination should be considered when products are designed; clearly the more stretch, the better the handle and drape of the laminated product.

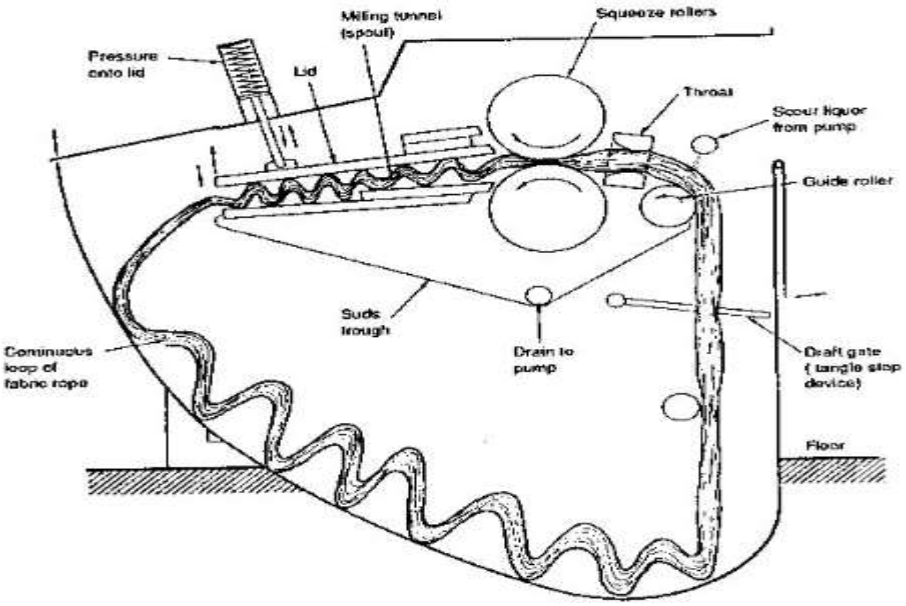
1.10 Mending

Newly made goods, which frequently show imperfections, are carefully inspected, and defects are usually repaired by hand operations. The first inspection of woollen and worsted fabrics is called perching. Burling, mainly applied to woollen, worsted, spun rayon, and cotton fabrics, is the process of removing any remaining foreign matter, such as burrs and, also, any loose threads, knots, and undesired slubs. Mending, frequently necessary for woollens and worsteds, eliminates such defects as holes or tears, broken yarns, and missed warp or weft yarns.

1.10.1 Milling

Milling is the finishing process that makes use of the natural propensity of wool fibers to migrate and become entangled within the yarn and fabric structures. Milling, which is the controlled felting of woven or knitted fabrics, is also known as fulling. The scale structure of the wool fibers, combined with their elastic properties in aqueous media, favours preferential migration of the fibers towards their root ends. As a result, the fabric consolidates in both the

warp and weft becomes thicker; leading to a higher mass per unit area. Milling also achieves reduced air permeability, increased strength and a hiding of the weave structure (i.e., high cover).Milling is achieved by intermittent mechanical action in the presence of a suitable aqueous liquor. Milling can be carried out under mildly alkaline conditions or under strongly acid conditions, using a suitable lubricant. Sodium soaps or synthetic detergents are used for alkaline milling whereas formic acid is commonly used for acid milling. Milling machines include stocks, rotary milling machines and combined scour/milling machines.



Milling machine

Three main milling systems are used in the rotary milling machine.

1. **Grease milling**. When soap-making yarn oils are used, alkali is added to the milling bath to saponify the oils. After milling, the fabric is scoured.

2. **Soap milling**. After scouring, the fabric is milled in dissolved soap noodles or synthetic detergent.

3. **Acid milling**. After scouring, the cloth is rinsed free of soap or detergent. The cloth is milled in a dilute solution of sulphuric acid. This method suits fabric dyed with dyes not fast to alkali.

Different substrates give varying results.

1. The higher the percentage of wool, and of fine wools in the blend, the faster the milling. Short wools mill more quickly than long wools.

2. Fabrics made from open-structured woollen yarns mill faster than those made from worsted yarn.

3. Low-twist yarns mill faster than high-twist yarns.

4. Tight fabric structures are slow to mill

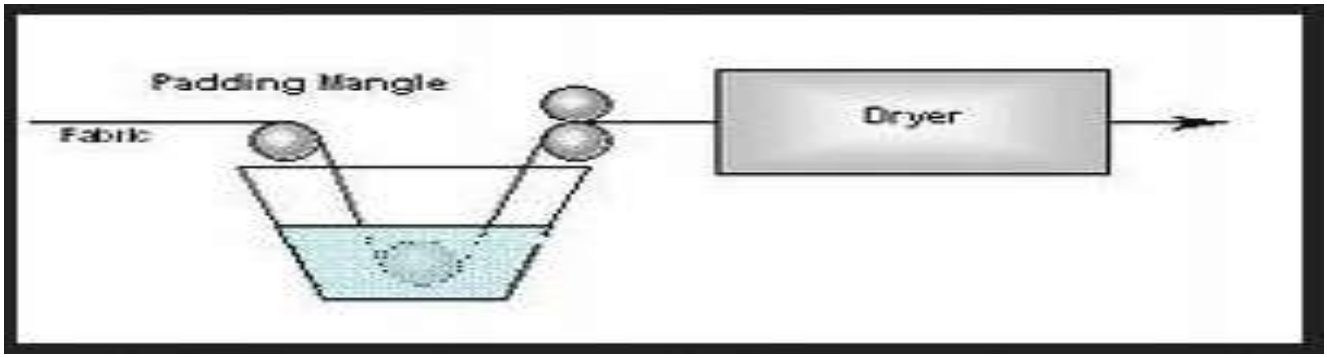
1.10.2 Padding

A padding device, usually a two-roll padder in front of a pin-tenter frame, applies the pigment padding system. In some cases, the padder is set up in front of a series of steam heated dry cans, which do not provide any width or heat control. The pigment padding system contains the pigment, the binder system, and an anti-migration system in water. After passing through the pad trough, the fabric is squeezed by the pad rollers to remove the excess solution and the fabric is guided onto the pin clips on the tenter frame.

The tenter frame oven or dry cans accomplish both the drying and the curing function. After exiting the oven, the fabric is batched on a roll-up device. 6 The addition of resin finishing chemicals to the pigment padding system allows for coloration and finishing of the fabric in one step. This procedure requires compatibility of the components for successful application. Pigment padding can be broken up into several steps for simplification similar to the printing system description.

The padding system application is composed of three stages:

- **Pad Bath Preparation**
- **Padding**
- **Dry / Cure**



1.10.3 Pressing

Pressing is the application of heat , moisture and pressure maintaining actual time to give shape, mold ,or crease on fabrics, garments, or garment parts into the geometric forms. Pressing is done for making the fabric smooth or to give it a perfect form. It is an important finishing process in apparel industry. Pressing or ironing is done during assembly or as a final finishing process.

Pressing operations;- pressing operations are two types

- Under pressing: - operating performed on apparels parts during making up .
- Top / final pressing:- final pressing operations are done on the fully assembled apparels.

Functions of pressing finishing

Functions of pressing are:-

- To remove the unwanted creases and crush make
- To induce creases to the garment based on the design requirement
- To enable the garment fit to the contour of the body
- To enable further sewing by preparing the garment for next sewing operation
- To finally finish the garment for packing

Ways of pressing:

Pressing is carried out using various means. Pressing is done by application of heat, moisture and pressure. moisture is used usually as steam. Various pressing equipments are available which use steam for pressing.

1.10.4 Printing

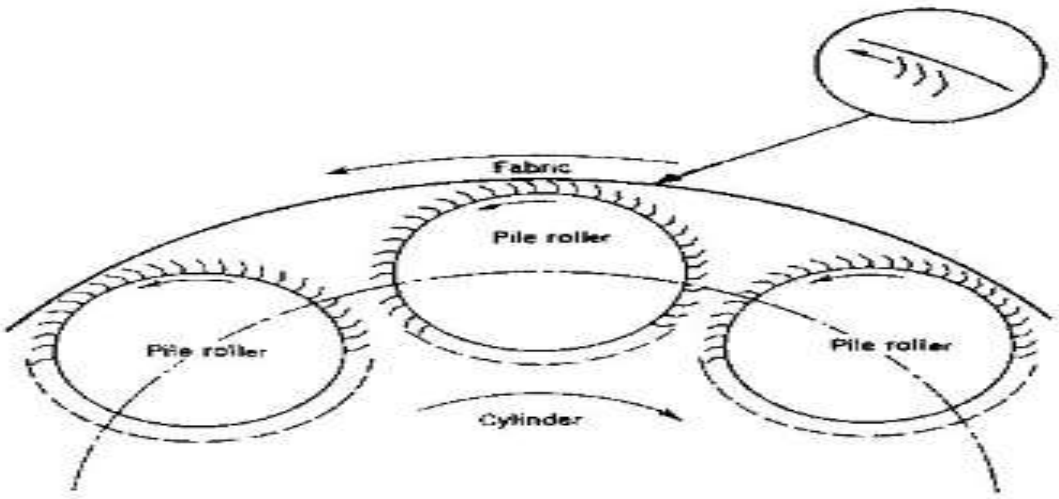
Printing is the application of colour in the form of a paste or ink to the surface of a fabric, in a predetermined pattern. It may be considered as localized dyeing. Printing designs on to already dyed fabric is also possible. The common processes are block printing, roller printing and screen printing

1.10.5 Raising

Another finishing process is raising. During raising, the fabric surface is treated with sharp teeth to lift the surface fibers, thereby imparting hairiness, softness and warmth, as in flannelette.

The aim of raising (or brushing) is to achieve desirable surface characteristics in the wool fabrics and to soften the handle. Raising is achieved using bristles (natural teazles) or bent metal wires to catch and lift fibers out of the plane of the fabric surface and make the fibers protrude as a pile or nap.

In raising, fabric surfaces are subjected to a tearing action that pulls fibers from the surface yarns and from within the fabric to form a raised surface (or pile or nap). The fabric is passed over rollers covered with strips of rubber-backed fabric in which bent wires are embedded, similar to those used in carding machines. The wire surface travels faster than the fabric and thus tears at the fabric surface.

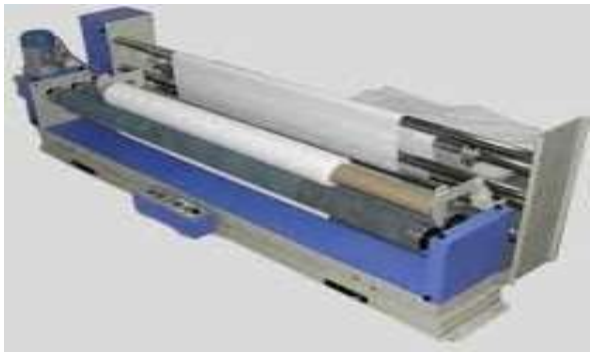


A single action planetary raising machine

1.10.6 Rolling

This process takes place when the fabric is set to our rolling department where it is checked by our inspectors, defected areas are marked by stickers and sent to our stitching department for final editing before production.

The fabric received in our rolling department after processing is inspected 100% on tables by our inspectors. There are two inspectors assigned per table to ensure that every yard is evaluated meticulously at our end. From there on, the fabric is rolled on a rolling machine and inspected a second time by our well trained inspectors for any defects that may have been left out in the initial checking.



Fabric rolling machine

1.10.7 Scouring

The loom state cotton fabric contains about 8-12% natural impurities of total weight of the fiber. These impurities mainly consist of waxes, proteins, hectic substances and mineral matters.

Scouring is a purifying treatment of textiles. The objective of scouring is to reduce the amount of impurities sufficiently to obtain level and reproducible results in dyeing and finishing operations.

1.10.8 Shearing

Is the removal of protruding ends of threads, knots, and hairs from the surface of a fabric, and making the length of the pile very even to improve the fabric's visual appearance and hand-feel. Both woven and knitted fabrics can undergo shearing. The process is carried out on shearing machines. Shearing is an important preparatory stage in the processing of

cotton cloth. The objective of "Shearing" is to remove fibers and loose threads from the surface of the fabric, thus improving surface finish.

Fabric shearing machine

1.10.9 Singeing

Singeing removes protruding fibers from the fabric surface by burning them, leaving the fabric smooth and bare.

Therefore the reasons for singeing should be considered more closely.

(i) Singeing improves the end use and wearing properties of textiles.

(ii) The burning-off of protruding fibers results in a clean surface

(iii) Singeing reduces the fogginess caused by differing reflection of light by the projecting fiber and the dyed fabrics appear brighter.

(iv) Singeing is an effective means of reducing pilling in blended fabrics

(v) Unsigned fabrics soil more easily than singed fabrics.

(vi) A closely singed fabric is essential for printing fine intricate patterns.

(vii) Singeing process facilitates and speeds up desizing.

1.10.10 Stabilizing

Stabilizing processes are required for improving properties such as strength, luster, and other qualities of the fiber. During washing and drying, fabric is subjected to lots of force and it’s sometimes stretched. In the stabilizing stage, fabric undergoes physical actions like the application of friction, pressure, or heat to achieve a desired effect. Its stabilized to prevent further shrinkage, create desired finished surfaces and ensure the best possible condition for dyeing and printing.

1.10.11 Tumbling

Tumble finishing, also known as **tumbling** or rumbling, is a technique for smoothing and polishing a rough surface on relatively small parts.

1.10.12 Washing

Rinsing and washing are the operations carried out most frequently during a complete textile finishing cycle. They are almost always connected to key treatments and aimed at removing from the fabric insoluble matters, matters already in solution or an emulsion of other impurities.

During the fabric preparation process, for example, washing is carried out after desizing, boiling and other bleaching and mercerizing processes; in dyeing, the washing stage is necessary to complete the dyeing process itself or to eliminate the dyestuff which has not been fixed; during the printing stage, washing performs a finishing action. When using vat dyes or disperse dyes, the washing process aims at removing insoluble pigment substances from the fiber surface by means of wetting or dissolving agents.

The sequence of the various washing steps is the following:

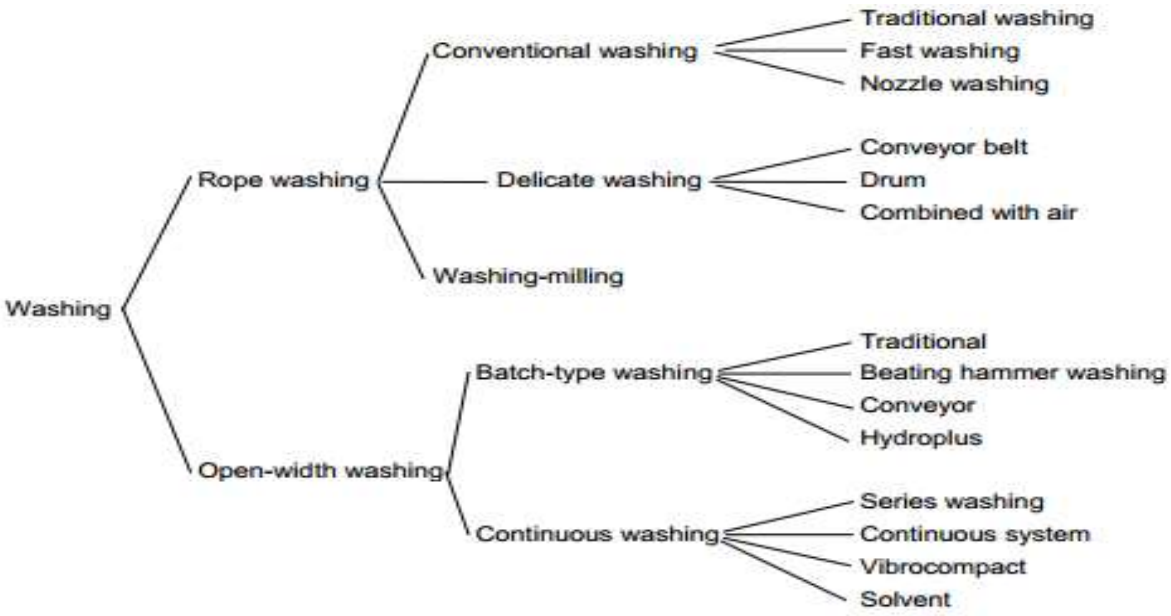
- formation of the detergent liquor (transfer of matter + energy by mixing);
- reaching of the process temperature and wetting (transfer of the liquor to the material);
- separation of impurities and emulsification (transfer of matter from one step to the other);
- removal of the liquor from the fiber (transfer of macroscopic matter);
- Drying (inter stage transfer of heat and matter).

Often these steps occur simultaneously. The use of surfactants (detergents) during the washing stage is extremely important to speed up the wetting of the textile material, to

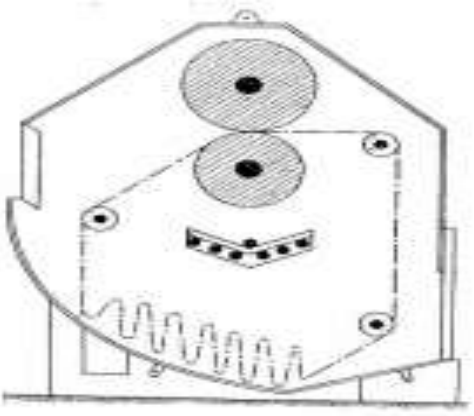
facilitate the removal of dirt from the substrate, thus keeping the emulsion inside the liquor and preventing the particles laying down again on the fiber

Washing machines

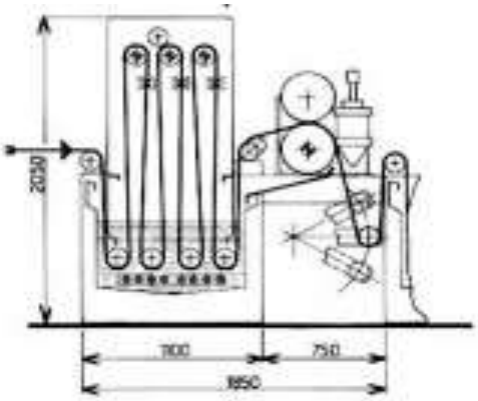
The scheme below shows all the categories of machines now in use; washing-milling machines are not included (combined washing and milling machines):



Washing can be performed on fabrics either in open-width or in rope form. Rope washing is more effective than open-width washing thanks to a stronger mechanic action, which favors the cleansing, and the relaxation of the fabric structure; for delicate fabrics an open-width washing must be preferred to avoid marks and creases. Open-width washing is also the best choice for processing huge lots.



Rope washing machine



open width washing machine

Self-Check -1	Written Test

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

Choose the best answer the following question

1, ……is process in which a polymeric layer is applied directly on one or both the surfaces of the fabric

A, Brushing B. coating C, beveling D, a and b

2, ……is a finishing process used to raise the surface fibers of a fabric

A, Cropping B, crushing C, Brushing D, CUTTING

3, which of the following finishing process is require protection from flames

A, Fire retardant treatment B, Lamination C, Milling D, padding

4, …….. is the application of colour in the form of a paste or ink to the surface of a fabric

A, Pressing B, raising C, padding D, printing

5,……. is a purifying treatment of textiles.

A, dyeing B, printing C, Scouring D, singing

6, ……is removes protruding fibers from the fabric surface by burning

A, singing B, Stabilizing C, Fire retardant treatment D, tumbling

Give Short answer the following question

1. List Confirming finishing processes for textile products
2. Write the Objectives of Cropping
3. List the stages of padding application system
4. Write Functions of pressing finishing
5. What are the reasons for singeing

Information Sheet-2	Textile products

Introduction

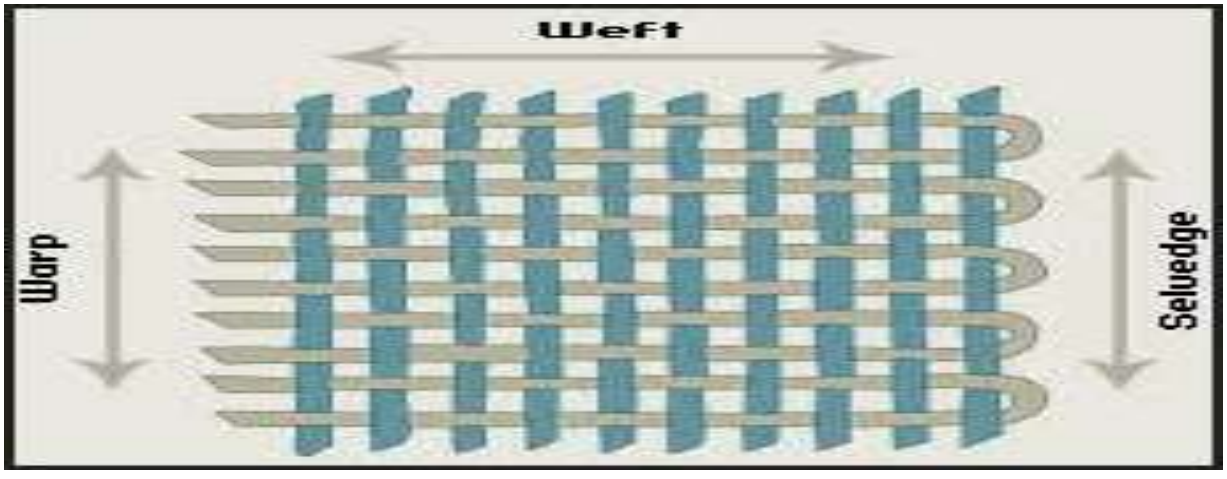
A **textile** is a flexible material consisting of a network of natural or artificial fibers (yarn or thread). Yarn is produced by spinning raw fibers of wool, flax, cotton, hemp, or other materials to produce long strands. Textiles are formed by weaving, knitting and non woven.

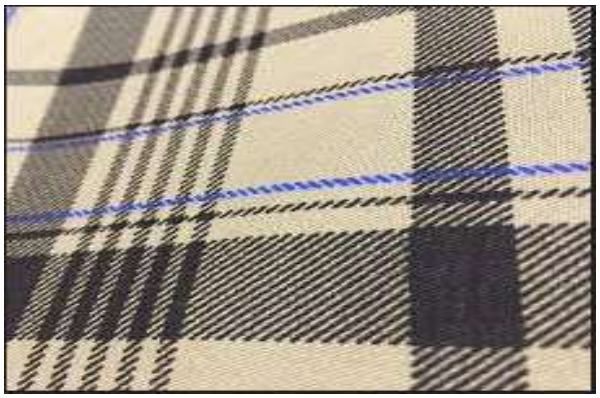
The related words "**fabric** "and "**cloth** "and "material" are often used in textile assembly trades (such as tailoring and dressmaking) as synonyms for *textile*. However, there are subtle differences in these terms in specialized usage. A *textile* is any material made of interlacing fibers, including carpeting and geotextiles. A *fabric* is a material made through weaving, knitting and non woven that may be used in production of further goods (garments, etc.). *Cloth* may be used synonymously with *fabric* but is often a piece of fabric that has been processed.

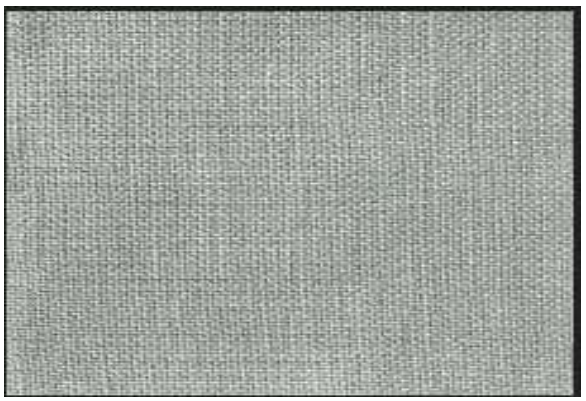
2.1.1 Woven or knitted fabric

Woven fabric

Weaving is the interlacing of two sets of yarns, namely warp and weft at right angle in order to product fabric. Woven fabric is any textile formed by weaving. Woven fabrics are often created on a loom, and made of many threads woven on a warp and a weft. Technically, a woven fabric is any fabric made by interlacing two or more threads at right angles to one another.



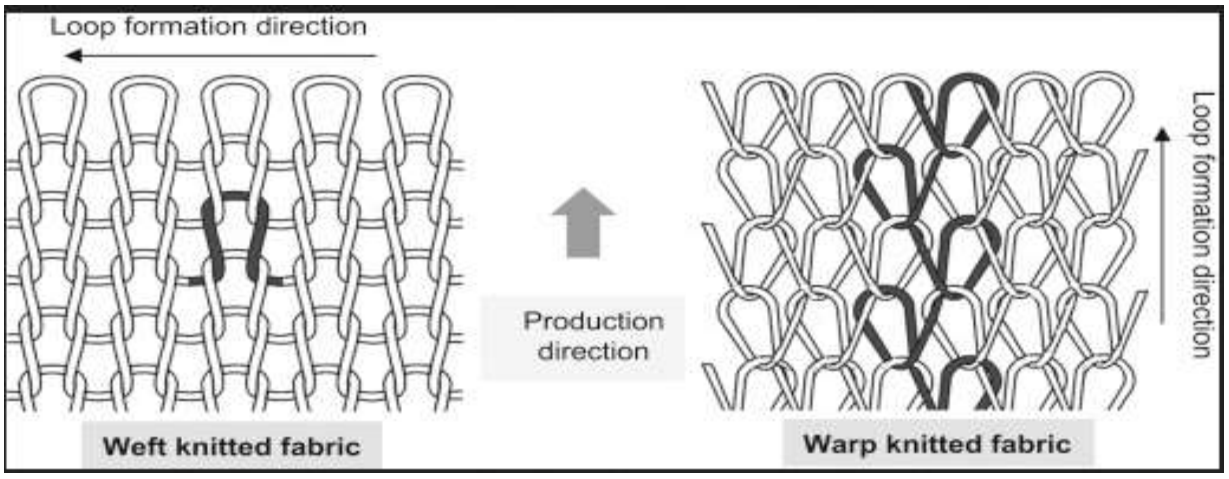




Woven fabrics

Knitted fabric

Knitting is a method of constructing fabric by intermeshing series of loops of one or more yarns . Knitted fabric is a textile that results from knitting. Its properties are distinct from woven fabric in that it is more flexible and can be more readily constructed into smaller pieces, making it ideal for socks and hats. Knitted fabrics are created by intermeshing loops of yarns using knitting needles. Knitted fabrics are subdivided into warp and weft knitted fabrics.



Knitted fabrics

Woven or knitted carpet

A carpet is a textile floor covering typically consisting of an upper layer of pile attached to a backing. The pile was traditionally made from wool, but since the 20th century, synthetic fibers such as polypropylene, nylon or polyester are used. Carpets are used for a variety of purpose, including insulating a person's feet from a cold tile or concrete floor, making a room more comfortable as a place to sit on the floor e.g. when playing with children or as a prayer rug, reducing sound from walking and adding decoration or colour to a room. Carpet can be produced on loom quite similar to woven fabric, made using needle felts, knotted by hand.

Woven carpet

Knitted carpet

2.1.2 Non-woven textile product

Non-woven fabric is a fabric-like material made from staple fiber or short and long fiber bonded together by chemical, mechanical, heat or solvent treatment. The term is used in textile manufacturing industry to denote fabrics, such as felt, which are nither neither woven nor knitted.

Application

Non-woven fabrics are broadly defined as sheet or web structures bonded together by entangling fiber or filament by mechanically, thermally or chemically. They are not made by woven or knitting and do not require converting the fiber to yarn. Non-woven fabrics are engineered fabrics that may be single use, have a limited life, or be very durable. Non-woven fabrics provide specific functions such as absorbency, liquid repellence, resilience , stretch, softness, strength, and flame retardancy, etc.

Non-woven materials are used in numerous applications

- Medical
- Filters
- Geotextiles

Manufacturing processes

Nonwoven are typically manufactured by putting small fibers together in the form of a sheet or web (similar to paper on a paper machine), and then binding them either mechanically with adhesive, or thermally by applying binder in the form of powder, paste or polymer melt and melting the binder on to the web by increasing temperature.

Self-Check -2	Written Test

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

Answer the following question

1, Define textile

2, define weaving and woven fabric

3, define knitting and knitted fabric

4, what are the functions of woven and knitted carpets

5, Define non-woven fabric

6, list application of non woven

Information Sheet-3	Checking textile product quality

Quality connotes different meaning to different people. Its concepts may be easy to grasp but formulating a universal definition is difficult. Several quality masters have defined quality in different ways considering different attributes of a product. Quality refers to the combination of characteristics of a product, process, or service that determines the product's ability to satisfy specific needs.

Some definitions are given below

- Quality is fitness for purpose or use. Or quality is customer satisfaction.
- Quality is conformance to requirements.
- Quality should be aimed at the needs of the customer, present and future.

Textile quality characteristics

Quality characteristics of textile products include the quality characteristics of fibers, yarn and fabric.

This is any distinguishing feature of a grade or a textile product i.e. appearance, dimension, performance, length of life, strength, thickness, reliability, durability, attractiveness, etc. Hence, every textile product possesses a number of elements that jointly describe what the user or consumer thinks of as quality.

The category of the above is as follows.

1. Physical characteristics- length, weight, volume, thickness, air permeability, etc.
2. Mechanical characteristics- Strength (tensile, tearing, Bursting), extensibility, stiffness, etc.
3. Time orientation- Reliability, durability, and serviceability.
4. Chemical characteristics - color fastness, water absorbency, etc.
5. Geometrical characteristics- structure of fibers, yarn and fabric

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, 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 non conformance 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.

Inspection of production material –

It consists of checking all the purchased part of raw material that is supplied. Inspection of this type of takes place at supplies end or customers (factory) gate

- Inspection of production process – Inspection of this type is done at various stages of men & machine and the critical production point.
- Inspection of finish goods: Finished and completely placed goods are inspected. It will carries out before marketing to check the quality product either rejected or sold at reduced price.

When we check the quality of product according to customer specifications. Customer specifications in textile finishing may be:- fabric physical and chemical properties

e.g. Color fastness
Fabric strength
Fabric luster

Self-Check -3	Written Test

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

Answer the following question

1, Define quality

2, Define specification

3, Write textile quality characteristics

4, List types of Inspection

Information Sheet-4	Reporting non-conforming materials

What is non-conforming material?

These are products that do not conform to product requirements. They are identified and controlled to prevent their unintended use or delivery. The controls and related responsibilities and authorities for dealing with non conforming product shall be defined in a documented procedure.

Information required

- Details of the source: order , lot identifiers, product
- Description of the material non-conformance and some category to classify them
- Inspector (who performed the inspection of the material)

All non-conforming materials or knitting and woven fabrics are reported before loading of the finishing machine

Non-conformance materials may include textile fabrics defects

Fabric defects are :-

- Holes fabrics
- Creases and folds fabrics
- Marked fabrics
- Impressions Inconsistent coverage of fabric
- Broke or pulled yarns on the fabric

Non-conforming materials reported by operators to supervisor and managers

Self-Check -4	Written Test

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

Answer the following question

1, define non-conforming material

2, what are non conformance textile materials

Information Sheet-5	Loading textile product

Before loading we are check the product quality according to specification and identify the fabric type, fabric length , and identify all requirement of finishing process , ready the machines to operate and adjust machine setting and finally load fabric in finishing machine .

Textile products are

- woven or knitted fabric
- woven or knitted carpet
- non-woven textile product

fabric chambers as per the capacity of the machine will be prepared in front of the machine straight to each chamber doors.

Finishing machine

Necessary machine set up parameters

- Circulation motors need to be on
- Winch drive need to be on
- Air Pressure need to maintained
- Minimum speed for loading should be set
- All emergency switches need to be checked.
- The necessary input parameters like batch size, pick up, nozzle gap, winch speed, cycle time and filling the right dyeing program.
- filling maximum hot process start water before loading

Self-Check -5	Written Test

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

1, what are loaded textile products

2, List Necessary machine set up parameters

Textile Chemical Processing

NTQF Level - II

Learning Guides - 22

Unit of Competence: Apply Finishing Processes to Textile production

Module Title: Applying Finishing Processes to Textile production

LG Code: IND CHP2 M07 L02 - LG22

TTLM Code: IND CHP2 TTLM7 0919v1

LO2. Operate and monitor finishing machines or equipment

Instruction Sheet	Learning Guide #22

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

2. Operate and monitor finishing machines or equipment.
   - 2.1 Apply finishing OHS Practice
     - 2.1.1 Hazard identification and control
     - 2.1.2 Risk assessment
     - 2.1.3 Risk reduction measures implementation
       - 2.1.3.1 Handling techniques
       - 2.1.3.2 Standard operating procedures
       - 2.1.3.3 Personal protective equipment
       - 2.1.3.4 Safe materials handling
       - 2.1.3.5 Taking breaks
       - 2.1.3.6 Ergonomic arrangement of workplaces
       - 2.1.3.7 Following marked walkways
       - 2.1.3.8 Safe storage of equipment
       - 2.1.3.9 Housekeeping
       - 2.1.3.10 Reporting accidents and incidents
       - 2.1.3.11 Environmental practices
   - 2.2 Undertaking Finishing processes
   - 2.3 Monitoring process and achieving quality standards
   - 2.4 Checking product
   - 2.5 Identifying product faults
     - 2.5.1 Holes
     - 2.5.2 Creases and folds
     - 2.5.3 Marks
     - 2.5.4 Impressions
     - 2.5.5 Inconsistent coverage
     - 2.5.6 Broke or pulled yarns
   - 2.6 Applying environmental requirements and procedure
   - 2.7 Identifying and correcting product process and minor machine faults
   - 2.8 Reporting Major machine or product 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

- Undertake OHS practices
- Undertake Finishing process.
- Achieved Process is monitored to ensure product specifications and quality standards.
- Check Product during and on completion of finishing process.
- Identify Product faults.
- Correctly apply Environmental requirements and procedures
- Identify Minor product process and machine faults
- Report .Major machine or product faults.

Learning Instructions:

1 Read the specific objectives of this Learning Guide.
2 Follow the instructions described in number 3 to 7.
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	Apply finishing OHS Practice

2.1 Apply finishing OHS Practice

Introduction

OHS Practice includes three main activities at work place. This includes: Hazard identification and control, Risk assessment and Risk reduction measures implementation.

2.1.1 Hazard identification and control

Introduction:

Concepts of hazards:

hazard: Anything (e.g. condition, situation, practice, behavior) that has the potential to cause harm.

Hazard Identification:

This is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job

Types of Hazards in a Workplace:

Commonly they are of four types. These are ergonomic hazards, physical hazards, biological hazards, chemical hazards and psycho- social hazards.

Ergonomic hazards:

Ergonomic hazards are problems that can occur when a worker’s physical workplace do not match up with his physical size or work positions. These types of hazards may occur in both office and industrial settings. Example: poor seating in computer class and weaving class.

Physical hazards:

These are workplace hazards that can affect the body. They may include radiation and excessive noise levels, falls.

Chemical hazards:

This may result if an employee inhales or absorbs harmful chemicals through his mouth, nose or via skin contact. Chemical hazards can come in several forms, such as liquids, vapors, gases or solids.

Biological work hazards:

It may occur if workers are exposed to living organisms, such as parasites, viruses, fungi and bacteria. These types of work hazards may also come from toxins.

Psycho-social hazards:

This can arise out of the many different ways that people interact with each other. This type of hazard may show up as negative work place conditions like bullying, violence or sexual harassment. This is due to stress outside or inside the work place, the type of work being done or the attitudes and behaviors that different people bring to their jobs.

Contributing factors for work place hazards:

These are categorized into four (4) types. People, materials, equipment and environment.

***Materials*:** Thinking about whether a material is proper for the job or not.

Environment: It refers to how conditions around workers and supervisors further impact hazard and work place safety. Example- are wor areas too cold or too hot?

Equipment's: this is determining whether equipment, tools and even protective equipment are proper for the job.

People: this is considering how the action or no-action of people influences work place hazards and situations.

2.1.2 Risk assessment

Risk Assessment Is defined as the process of assessing the risks associated with each of the hazards identified so the nature of the risk can be understood. This includes the nature of the harm that may result from the hazard, the severity of that harm and the likelihood of this occurring.

Risk Assessment Procedure

The risk assessment procedure can best be illustrated in the following way.

Step-1: identify hazards

Step-2: Assess Risks

Step-3: Control Risks

Step-4: Review created measures

Step 1: Identify Hazards

In order to identify hazards the following are recommended:

a. Past incidents/accidents are examined to see what happened and whether it could occur again.

b. Employees be consulted to find out what they consider are safety issues.

c. Work areas are inspected to find out what is happening now. Identified hazards should be documented to allow further action.

d. Information about equipment (e.g. plant, operating instructions) and Material Safety Data Sheets are reviewed to determine relevant safety precautions.

e. Welcome creative thinking about what could go wrong takes place, i.e. what hazardous event could take place here?

Step 2: Assess Risks

It involves considering the possible results of someone being exposed to a hazard and the likelihood of this occurring. It determines how severe a risk is and existing control measures are effective.

A risk assessment should include:

i. Identify factors contributing to the risk.

ii. Review health and safety information from source and its particular hazard.

iii. Evaluation of how severe the harm could be. This is types of injuries.

iv. Determining the likelihood of harm occurring. The level of risk will increase as the likelihood of harm and its severity increases.

v. Identify the actions necessary to eliminate or control the risk.

vi. Identify records that it is necessary to keep to ensure that the risks are eliminated or controlled.

Step 3: Controlling Risks

Once a risk rating is determined, each hazard has its risk control measures evaluated using the Evaluation of Control Effectiveness Table. This allows for determination of any additional requirement necessary.

Evaluation of Control Effectiveness Table

Well Designed Control ?		Effectively Implemented ?	
3	Needs improvement	3	Deficient *(b)*
2	Adequate	2	Marginal
1	Strong	1	Effective

Step 4: Implement additional risk controls

The Hierarchy of Controls (see diagram below) ranks control options from highest level of protection and reliability to lowest. This should be used to determine the most effective control/s.

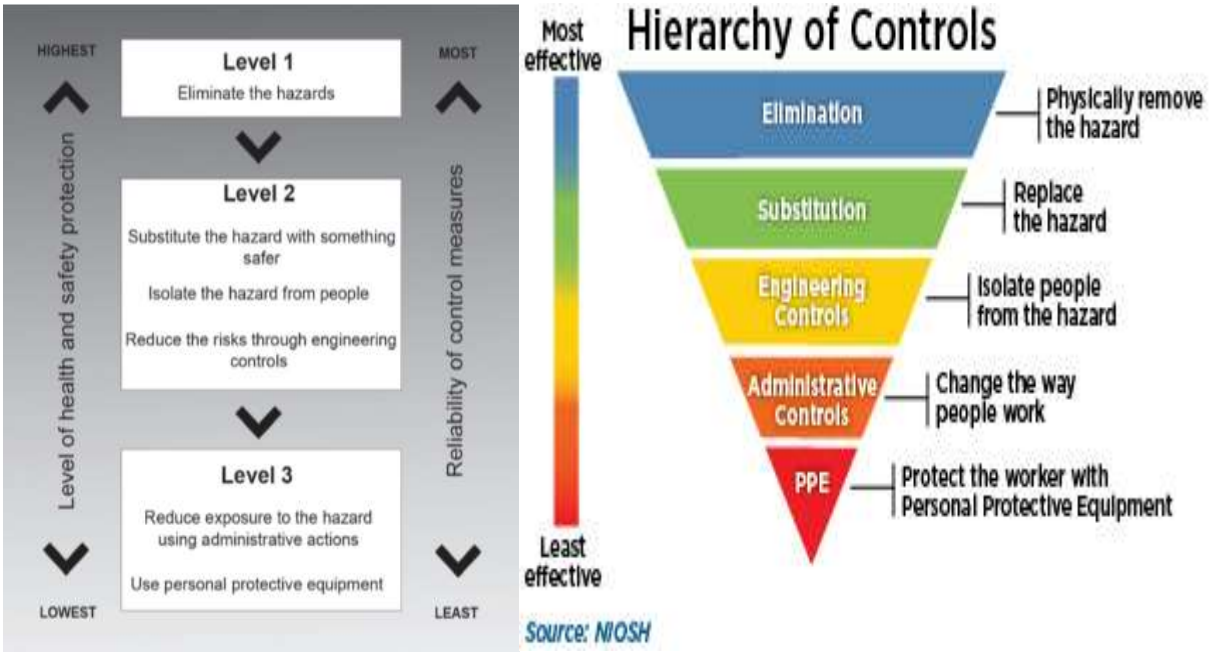


Figure: Hierarchy of Controls:

Level 1 Control Measures:

It is eliminating the hazard and associated risks. It is the most effective control measures. This can be achieved through removing the hazard or selecting alternate products or equipment to eliminate the risk. If a hazard cannot be eliminated then risks can be minimized by lower control measures

Level 2 Control Measures:

This is used to minimize the risks by involving following as separate or as a combination.

a. *Substitute the hazard:* substitute method or material to reduce the risk or hazard.

- *Isolate the hazard:* separate the hazard from the workplace or people. Example- Chemical store room kept locked except to an authorized person.

b. *Use engineering controls:* Modify existing machinery or plant or purchase different machinery to provide a physical solution. Example: Guard rails.

Level 3 Control Measures:

These are control options that are considered last as they do not control the source of the hazard but rely on human behavior or supervision and are therefore less effective. They include;

i. ***Administrative Procedures*:** Develop work methods or procedures to reduce the conditions of risk.

a. Written Safe Operating Procedures

b. Job rotation to restrict hours worked on difficult jobs.

c. Staff trained in the correct operating procedures.

ii. ***Use Personal Protective Equipment:*** this offer the lowest level of protection and the last resort to deal with the hazard, where the hazard cannot be removed.

Example:

a. Handling of chemicals – gloves, safety glasses, aprons.

b. Protecting eyes from flying particles.

c. Protecting feet – safety boots.

Step 5: Monitor and Review

Hazard identification, risk assessment and control are an on-going process. Therefore, regularly review the effectiveness of your hazard assessment and control measures. Make sure that you undertake a hazard and risk assessment when there is a change to the workplace including when work systems, tools, machinery or equipment change.

The effectiveness of control measures can be checked through regular reviews as well as consultation with workers.

2.1.3 Risk reduction measures implementation

Specifically to this competence Risk reduction measures implementation may include. Manual handling techniques, Standard operating procedures, Personal protective equipment , Safe materials handling, Taking rest breaks, Ergonomic workplaces arrangement , Following marked walkways, Safe equipment storage, Housekeeping, Reporting accidents and incidents and Environmental practices. These are explained as follow.

2.1.3.1 Handling techniques

Manual handling refers to any activity that requires the use of force to lift, lower, push, pull, carry or move a person, animal or object. By observing simple, safe manual handling methods, you can avoid manual handling injuries. Have a look at Darren's story, below. Incorrect manual handling can cause different types of injuries. Long-term injuries can include damage to the spine and joints. Short-term injuries include sprained ligaments or torn/strained muscles.

Preparing for a manual handling job:

There are a few easy steps you can follow to make sure that you're ready for a manual handling task. .

f. **Warm up:** Just as you'd warm up before taking part in sports or exercise, you need to warm up before you handle a heavy load

g. Check the load:

Have a good look at the load. Check for:

- ❖ Areas where you can get a firm grip on the load
- ❖ The overall size and shape of the load
- ❖ The weight of the load, loads that are less than 20kg handle manually and beyond that, you should use equipment such as a fork lift to move these loads.

h. Move yourself into position: Get close to the load and put yourself in the best position to handle the load.

Safe lifting methods:

Lifting a heavy object can strain your back and knees. There are 10 safe steps to follow when you have to lift a heavy object.

Assess the load → Get close to the load → set your feet apart for balance

Lower your head ← lower body and bend your knees ← Relax your knees

Get a firm grip → Raise your head and look ahead → Straighten your legs

Lift; turn your leg before walk

2.1.3.2 Standard operating procedures

A standard operating procedure is a set of step-by-step instructions compiled by an organization to help workers carry out complex routine operations. It is aimed to achieve efficiency, quality output and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations. Different templates may be used to develop SOP.

2.1.3.3 Personal protective equipment

Personal protective equipment (PPE) refers to protective clothing, helmets, goggles or other garments or equipment designed to protect the wearer's body from injury or infection.

2.1.3.4 Safe materials handling

Material handling involves short-distance movement within the confines of a building or between a building and a transportation vehicle. It utilizes a wide range of manual, semi-

automated and automated equipment and includes consideration of the protection, storage, and control of materials throughout their manufacturing, warehousing, distribution, consumption, and disposal. Example-using Overhead systems, Conveyer systems, Underground systems and etc.

2.1.3.5 Taking breaks

An employer should give an employee enough breaks to make sure their health and safety isn't at risk. It is of 3 types:

a. Rest breaks at work,
b. Daily rest and
c. Weekly rest.

a. Rest breaks at work:

Workers have the right to one uninterrupted 20 minute rest break during their working day, if they work more than 6 hours a day. This could be a tea or lunch break.

The break doesn't have to be paid - it depends on their employment contract.

b. Daily rest: Workers have the right to 11 hours rest between working days, eg if they finish work at 8pm, they shouldn't start work again until 7am the next day.

c. Weekly rest: Workers have the right to an uninterrupted 24 hours without any work each week

2.1.3.6 Ergonomic arrangement of workplaces

Workplace ergonomics is the practice of designing workspace in a way intended to minimize employee health risks and increase employee productivity, thus reducing employer costs. Try to observe the following two figures!

Benefits of superior ergonomics:

- ❖ Happier employees
- ❖ Higher production
- ❖ A greater safety commitment and etc.

2.1.3.7 Following marked walkways

The uses of marked walkways are:

- ❖ Separate workers from machines and moving equipment:

- Warn of hazardous areas
- Provide instruction and etc.

Industrial environments can be hazardous, particularly if one is not familiar with the activities. A simple way to stay out of harm's way is to:

- Keep your eyes open
- Observe all signage
- Stay behind barricades
- And use marked walkways at all times

2.1.3.8 Safe storage of equipment

Create a plan for storing all equipment and materials at your site. Assign a specific location to each item or type of item and label the space accordingly. Make certain that work areas and walkways are kept clear of all stored items. Use tape or paint to identify such areas on the floor of a large area, such as a manufacturing facility. In an office, laboratory or similar smaller setting, use cabinets with doors that close securely. Always leave at least 1.5 feet between the top of stored items and fire sprinklers, if present. Make sure that all stacks are solid and secure them whenever possible.

2.1.3.9 Housekeeping

Housekeeping refers to the management of duties and responsibilities involved in the running of a household, such as cleaning, cooking, home maintenance, shopping, laundry and any activities performed in house. These tasks may be performed by any of the household members or by other persons hired to perform these tasks. The term is also used to refer to the money allocated for such use.

2.1.3.10 Reporting accidents and incidents

Accidents and unexpected incidents at work are something you try to avoid. But they can happen. This all starts, with reporting. Employees should report all accidents and incidents to their employer by filling to the accident book. Employers should investigate all reports and notify their insurance company.

Accident reports can be used to:

- Gather information
- Identify problems
- Prevent it from happening again
- Provide training
- Improve management skills

- ❖ Comply with legal requirements and etc.

In any case, it's best to report and investigate accidents quickly. You can get more information while the incident is fresh in everyone's minds. And, the quicker you act to fix any problems found, the less risk of it happening again.

2.1.3.11 Environmental practices

The term best environmental practice means the application of the most appropriate combination of environmental control measures and strategies. These may include: recycling and re-use; saving resources, avoiding the use of hazardous substances and etc.

Self-Check -1	Written Test

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

1. Try to define the word hazard. (1point)
2. List and discuss different type's work place hazards. (5points)
3. List and discuss hazards contributing factors. (4points)
4. List risk assessment procedures. (4points)
5. Draw and analyze hierarchy of controls. (5points)
6. List and explain risk reduction measures implementation. (11points)

Information Sheet-2	Undertaking Finishing processes

2.2 Undertaking Finishing processes

Fabric finishing (definition): Any operation (other than preparation and coloring) that improves the appearance and/or usefulness of fabric after it leaves the loom or knitting machine. Finishing of fabric is the final operation in wet processing department and it is often the 'finish' which increases the sale value of textile goods.

The main objectives of fabric finishing include:

- Highest dimensional stability
- Excellent fabric handle
- Optimal compaction.

What is finishing?

- Finishing is a final process given to a textile material to
  - Give a good appearance
  - Desirable feel
  - Impart certain durable properties
    - Stiffness
    - Softness
    - Wash and wear finish
    - Water repelling finish
    - Fire proof finish etc.
  - To impart some desired functional properties

- **Classification according to the nature of finish**

- **According to the nature of Finish**

✓ **Physical or Mechanical Finish**

1) Calendaring

2) Sanforizing etc.

✓ **Chemical Finish**

1) Mercerization

2) Easy care finish etc.

- Physical or Mechanical Finish

1) Mechanical / Physical finishes involve specific physical treatment to a fabric surface to cause a change in the fabric appearance

2) Also known as dry finish

1) Compacting (Shrink proofing)

2) Calendaring

3) Raising (Napping, Sueding)

4) Shearing

5) Polishing

6) Corduroy Cutting

7) Decating

3) Chemical Finish

1. Chemicals are used followed by curing or drying

2. Also known as wet finish

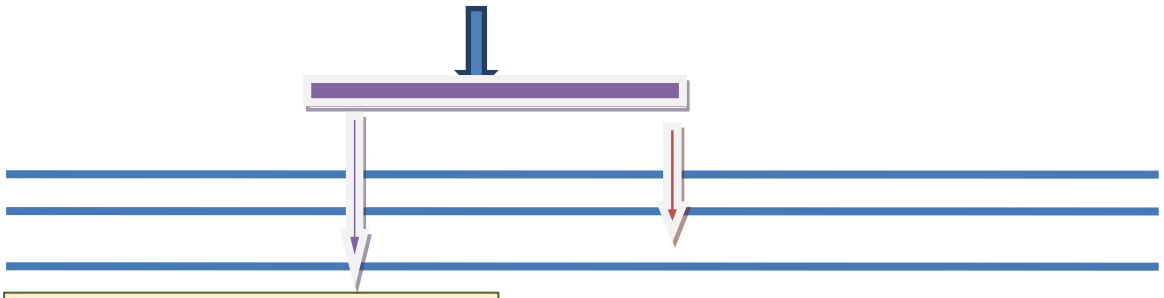
According to degree of permanence

- ✓ Permanent Finish
- ✓ Durable Finish
- ✓ Semi - Durable Finish
- ✓ Temporary Finish

Definition

- Permanent Finish: Usually involve a chemical change in fiber structure and do not change or alter throughout the life of the fabric
- Durable finish: Usually last through the life of the article, but effectiveness becomes diminished after each cleaning; and near the end of the normal use life of the article, the finish is nearly removed
- Semi-durable finish: Last through several laundering or dry cleanings and many are renewable in home laundering or dry cleaning
- Temporary finish: Are removed or substantially diminished the first time the article is laundered or dry cleaned

According to Performance



- ✓ **Aesthetic Finish– Improved / Altered Appearance**
  1. Calendaring
  2. Fulling
  3. Mercerization
  4. Napping and sueding
  5. Plisse
  6. Shearing

- ✓ **Functional Finish– Improved / Altered Performance**
  1. Antiseptic
  2. Antistatic
  3. Crease resistant
  4. Durable press
  5. Flame resistant
  6. Mothproofed
  7. Shrinkage control
  8. Soil release
  9. Water and stain repellent
  10. Waterproof

- **Aesthetic Finish**
  - These finishes modify the appearance and / or hand or drape of fabrics
- Aesthetic Finishes modify the appearance and /or hand or drape of the fabrics.
- Fulling
- Mercerization
- Napping And Sueding

- Plisse
- Shearing
- Softening
- Stiffening
    - **Functional Finish**
    - These finishes improve the performance properties of fabrics

- Functional Finishes improve the performance properties of the fabric ; like durability, strength etc.
- Antimicrobial/Antiseptic
- Antistatic
- Crease resistant
- Durable Press
- Flame Resistant
- Mothproof
- Shrinkage Control
- Soil Release
- Waterof/Repellant

Dyeing

In dyeing textiles are brought into contact with aqueous dyestuff solutions, a great variety of chemicals (salts, acids, etc.), and dyeing auxiliaries (surfactants, dispersing agents, leveling agents, etc.).

Kind and quantity of dyes, chemicals and auxiliaries are substrate specific and depend on the product quality (e.g. fastness properties) and the installed machinery.

Coloration with dyes is based on physico-chemical equilibrium processes, namely diffusion and sorption of dye molecules or ions.

Pressing

It can be defined as a process which changes the geometric fiber structure of the area being pressed by the controlled application of heat, steam and pressure. In this sense, removing crease from a garment involves the same changes of fiber lay as that required to open a steam or top press a hem.

Softening

- Required for more pleasant hand and better drapability
- Fabrics are harsher and stiffer because of their construction or due to some prior finishing process
- Softening can be done by either mechanical or chemical process
- Simple calendaring softens hand, but it is temporary

Stiffening

Some fabrics need to be made stiffer and more crisp as per as the end use Stiffening agents are applied to the cloth to build up the following properties

- To increase the weight of the fabric
- To improve the thickness
- To improve luster
- But, their effect is temporary and once the fabric is washed, most of the finishes are removed

Stone washing

- Stone washing transforms a new unworn garments into used-looking faded garments
- Done in garment form
- Pumice stone are used
- No chemicals are used for fading
- Pumice stone are added to the laundry with the garments which abrade the garment
- Worn look

- Faded color
- The garment also become softer and obtain a casual look

Self-Check 2	Written Test

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

Answer the following questions

1, define finishing process

2, what are the main objectives of fabric finishing

3, write classification of finishing

Information Sheet-3	Monitoring process and achieving quality standards

2.3 Monitoring process and achieving quality standards

Monitoring Process

Monitoring is ongoing assessment of how activities and materials are being implemented by whom, for whom, with whom, how, when and where Process monitoring falls under the overall evaluation of a program. Monitoring is the regular observation and recording of activities taking place in a project or program. Reporting enables the gathered information to be used in making decisions for improving project performance. Purpose of Monitoring: Monitoring is very important in project planning and implementation

Production | Plant view

The plant view enables the transparent monitoring of machines and all required resources. The graphic real-time display of the machine status and the integrated alarm server identify problems immediately. The master data for machines, personnel and shift calendar are easy and flexible to manage.

Planning | Control

Production planning for all production processes can easily be carried out with flexibility within the network .For determining the planned completion dates, all relevant parameters are considered – e.g. style, speed, efficiency, shift calendar etc.

The compatibility check supports the process of selecting the most appropriate machine**.** The integrated alarm server monitors the compliance with the projected completion date for all production processes.

Recipe management | Colour matching

The recipe management is for all production processes from preparation to dyeing, printing, finishing and lamination. The integration of colour matching guarantees the optimal use and integration in the MES solution.

Machine settings

The machine settings realize the fully integrated communication of inter machine and enable the automatic transmission of all relevant control data and setting data according to the production planning and commencement of the job.This allows for the complete compilation of all relevant production data, down to the last detail.

Quality | Management & Tracking

Quality management enables the monitoring and evaluation of all quality-relevant data in all production processes. The quality data can also be structured and filed according to order, style and piece.

Self-Check 3	Written Test

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

Answer the following questions

1, define Monitoring Process

2, List Purpose of Monitoring

2.4 Checking product

Fabric inspection

The fabric inspection can be used for all production processes – from the grey fabric inspection, the fabric inspection during production, the preview for the cut optimization to the final inspection for the finished piece. The use of standardized types of errors and structured compensation schemes optimize the application in daily production.

Modern textile manufacturers employ progressively more sophisticated methods and use a variety of natural, man-made, and synthetic fibers. The quality and durability of fabrics are directly affected by the quality of fibers, correct choice of dyes and colorants, and the use of appropriate manufacturing processes.

Inspections and laboratory tests for all modern textiles, including:

- Textile and canvas rolls
- Home textiles, carpeting, curtains, and upholstery
- Textile checks on finished products (garments, apparel, accessories, toys)

Our quality control and testing services help textile mills, manufacturers, importers, and retailers ensure that their products meet their own quality standards and the requirements of their destination markets. We provide detailed same-day inspection reports and 48-hour turnaround on lab tests, giving you the fast and reliable results you need to make an informed decision for your textiles supply chain.

Textiles Testing Expertise

QIMA's experienced inspectors conduct thorough on-site checks of your merchandise, following detailed checklists compiled based on your requirements, international regulations, safety standards, and our extensive know-how.

Textiles Lab Testing Expertise

In addition to the above physical and mechanical tests, QIMA offers a wide range of laboratory tests to help you navigate the safety requirements and meet the standards of your destination market.

General Lab Tests for Textiles

- Fiber identification
- Eco-textile testing
- Banned azo dyes and colorants
- Colorfastness check (CF to light, ozone, burnt gas fumes, phenolic yellowing perspiration, water, bleach)
- Antibacterial and antimicrobial testing
- Formaldehyde testing
- Machine wash tests
- Heavy metals in surface coatings

EU Textile Standards & Regulations

- REACH (Regulation on Registration, Evaluation, Authorization, and Restriction of Chemicals)
- Textile Regulation 1007/2011
- General Product Safety Directive (2001/95/EC)
- Textile labeling regulations
- EU Ecolabel for textile products

USA and Canada Textile Standards & Regulations

- AATCC 8 Colorfastness to Crocking (wet & dry)
- AATCC 15 Colorfastness to Perspiration
- AATCC 16 Colorfastness to Light
- AATCC 106 Colorfastness to Sea Water
- AATCC 107 Colorfastness to Water
- AATCC 116 Colorfastness to Crocking (rotary)
- AATCC 135 Dimensional Stability for Home Laundering
- AATCC 150 Dimensional Changes to Home Laundering
- AATCC 162 Colorfastness to Chlorinated (Pool) Water
- AATCC 112 Formaldehyde Release from Fabric (quantitative) – sealed jar method
- AATCC 94-2017 Formaldehyde (spot test)
- 16 CFR 1610 Flammability of Clothing Textiles
- 16 CFR 1611 Flammability of Vinyl Plastic Film
- 16 CFR 1615 & 1616, Flammability of Children's Sleepwear
- 16 CFR 1500.51-53 Attachment Strength
- 16 CFR 423 Care Labeling
- 16 CFR 303 Fiber Content Label
- Canadian Textile Flammability Regulations (SOR/2011-22) – Bedding Textile
- Canadian Textile Flammability Regulations (SOR/2011-22) – Non-bedding Textile
- Canadian Toys Regulations (SOR/2011-17) Item 34, Flammability Requirement of Hair or Mane

Self-Check 4	Written Test

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

Answer the following questions

1, what are inspections and laboratory tests for all modern textiles

2, what are General Lab Tests for Textiles

3, write EU Textile Standards & Regulations

4, list five USA and Canada Textile Standards & Regulations

Information Sheet-5	Identifying product faults

2.5 Identifying product faults

Introduction:

In textile industry, woven fabrics are produced by interlacing warp and weft yarn. Faulty woven fabrics hampers the total quality of woven garments such as shirt, pant, trouser, jacket etc. As a textile engineer you should know about the major woven fabric faults which produced during woven fabric manufacturing. As its importance this article has shown those woven fabric faults with their images.

2.5.1 Holes

A hole is an imperfection where one or more yarns are sufficiently damaged to create an opening in the fabric.

Holes are typically treated as a major defect in the fabric and are assigned either two or four penalty points during fabric inspection, depending on their size.

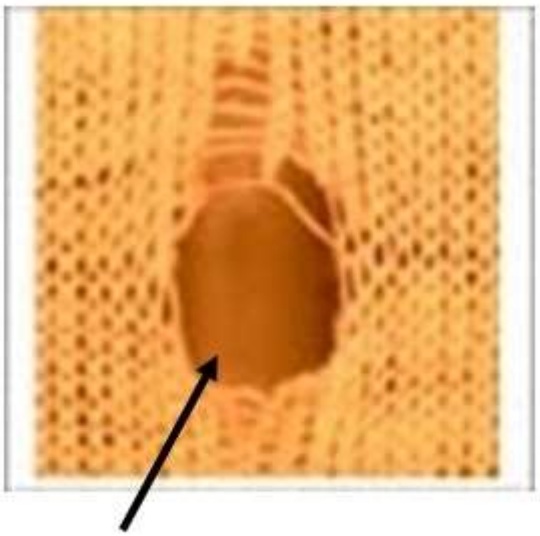
Causes and prevention of hole

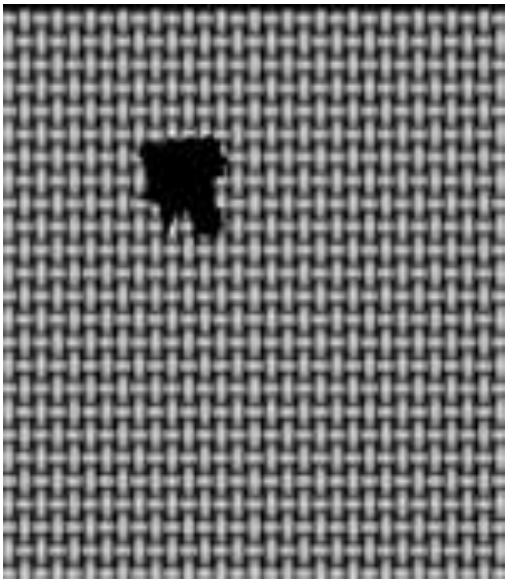
Holes are usually caused by an accidental cut or tear to the fabric. Broken needles or rough mechanical parts are common culprits for fabric tearing during manufacturing. Prevent future holes by ensuring your supplier has procedures in place to regularly check needles and machinery prior to production. A fabric imperfection in which one or several yarns are sufficiently damaged to create an opening.

Faults in the Knitted Fabrics:

Definition:

Drop Stitches are randomly appearing small or big holes of the same or different size which appear as defects in the Knitted fabrics.





Major Causes:

- High Yarn Tension
- Yarn Overfeed or Under fee
- High Fabric Take Down Tension
- Defects like Slubs, Neps, and Knots etc.
- Incorrect gap between the Dial & Cylinder rings.

Remedies:

Ensure uniform yarn tension on all the feeders with a Tension Meter.

1. Rate of yarn feed should be strictly regulated as per the required Stitch Length.
2. The fabric tube should be just like a fully inflated balloon, not too tight or too slack.
3. The yarn being used should have no imperfections like; Slubs, Neps & big knots etc
4. The gap between the Cylinder & the Dial should be correctly adjusted as per the knitted loop size.

2.5.2 Creases and folds

A crease is a line, ridge, or groove in a paper or fabric, made by pressing, folding, or wrinkling with or without the aid of heat, pressure, and moisture. The fibers in the crease region may be irreversibly crushed or broken.

Folding

Folds occur when one or a stack of originally flat and planar surfaces, such as sedimentary strata, are bent or curved as a result of permanent deformation. Folds form under varied conditions of stress, hydrostatic pressure, pore pressure, and temperature gradient, as evidenced by their presence in soft sediments, the full spectrum of metamorphic rocks, and even as primary flow structures in some igneous rocks.

2.5.3 Impressions

Backing fabric is often used to cushion fabric being printed. If there is a joining seam in the backing fabric, an impression will result on printed fabric.

2.5.4 Inconsistent coverage

Inconsistent describes something that's varied or irregular fabric formation

2.5.5 Broke or pulled yarns

This defect appears as a broken filling yarn in the fabric weaving. It appears as a sharp discontinuity in the weave pattern over the pick length.

Causes and prevention of broken pick

A broken pick is the result of a break or cut in filling yarn, which results in the insertion of a partial pick in the fabric. This can happen after weft break, weft exhaustion or a faulty weft fork mechanism. Correcting weft stop motion will ensure broken picks are detected before they're inserted into the fabric. Ensuring weaving personnel are trained to identify and replace a broken pick during production can also help prevent the appearance of this defect in the finished goods.

Broken end

A broken end appears as a broken, untied warp end of a fabric.

The yarn is usually broken during weaving or finishing. Broken ends appear as equidistant horizontal lines along the fabric width.

Causes and prevention of broken end

This defect is caused by yarn breakage. When the yarn breaks during weaving or finishing and is then woven into fabric the result is a broken end.

Some possible causes for broken ends include:

- Poor preparation
- Weak or irregular yarn
- Excessive warp tension

Self-Check 5	Written Test

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

Answer the following questions

1, identify and explain product faults

Information Sheet-6	Applying environmental requirements and procedure

2.6 Applying environmental requirements and procedure

Environmental practice is critical issues in all manufacturing and service provider companies. Now a day in order to build sustainable and conducive environment textile sectors play a great roles by reducing pollutant chemicals and waste products/materialst the work place environment in a majority of industry is unsafe and unhealthy. These includes poorly designed workstations, unsuitable furniture, lack of ventilation, inappropriate lighting, excessive noise, insufficient safety measures in fire emergencies and lack of personal protective equipment. People working in such environment are prone to occupational disease and it impacts on employee's performance. Thus productivity is decreased due to the workplace environment.

Working environment is abroad term and means all your surrounding s when working . your physical working environment is for example, your work tools as well as air, noise and light

Definitions Environmentally sustainable work practices are those which reduce harm on the

Environment and reduce wastage of resources.

Procedure

General guidelines for sustainable environmental work practices

All employees can help protect the environment by following the guidelines below:

Reduce;- Use goods which stop waste being generated. Reduce waste by choosing products that have minimal packaging and can be used productively

And then recycled.

Re-use;-Re-use containers, packaging or waste products, wherever possible.

Recycle;- Recycle waste material into useable products, wherever possible.

Self-Check 6	Written Test

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

Answer the following questions

1, define Environmental practice

2, Define Environmentally sustainable work practices

3, what are General guidelines for sustainable environmental work practices

Information Sheet-7	Identifying and correcting product process and minor machine faults

2.7 Identifying and correcting product process and minor machine faults

Fabric Finishing: A series of processing operations applied to gray fabrics to enhance their appearance and hand, properties and possible applications. Play a fundamental role for the com excellence of the results of textiles. The simplest form of finishing ironing or pressing on the fabric. In finishing , the fabric is mechanical and chemical treatment in which its quality and appearance are improved and its commercial value enhanced. Physical finishing techniques (dry processes) or chemical finishing methods (wet finishing) are used.

Finishing defects

Functional finish: Wear ability, Hand, Mechanical resistance, Easy care, Wet ability, Wash ability, Deformability, Anti bacterial, Anti fungal, Soil-proof and Fire-proof ability.

Aesthetic finishes: Aesthetic looks

The defects which are occurred in finishing process are enlisted below:

- **Wet squeezer marks**

Causes

• These marks are caused due to excessive pressure of the squeezer rolls on the wet fabric.

Remedies

• Use the padding mangle only for the application of the softener.

• Use a hydro extractor (centrifuge) for the extraction to avoid the squeezer roll marks.

• After extraction open the fabric manually to prevent crease marks in the damp fabric

- **GSM Variation**

Causes

• Roll to roll variation in the process parameters of the fabric like overfeed and widthwise stretching of the dyed fabric on the stenter,

calender and compactor machines.

Remedies

• Make sure that all the fabric rolls in a lot are processed under the same process parameters.

- **Bowing**

Causes

• Uneven distribution of tension across the fabric width while dyeing or finishing the fabric.

Remedies

• Bowing can be corrected by reprocessing the fabric by feeding it from the opposite end.

- **Skewing**

Causes

• Improper feeding of the fabric while compacting.

Remedies

• Use a drop needle line as a reference line to keep the grain lines straight while feeding the fabric slowly on the compactor machines.

You may like also: Dyeing faults and remedies

- **Shrinkage**

Causes

• Shrinkage is primarily due to high tension during the knitting, dyeing and the finishing processes.

Remedies

• Allow the fabric to relax properly before it is cut out.

• Give maximum overfeed to the fabric during the processing on the stenter and compactor machines.

- **Over Compaction**

Causes

• Excess shoe pressure.

• Excess overfeed (compaction) given to fabric with respect to potential shrinkage.

Remedies

• Potential shrinkage test.

• Correct setting of machine.

• Re-compaction with lesser over-feed.

- **Fabric width variation**

Causes

• If the stretched width is vary from roll to roll while feeding the fabric in the stenter and compactor.

Remedies

The stretched width of the fabric should remain constant for each roll during finishing in the stenter and in the compactor

Self-Check 7	Written Test

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

Answer the following questions

1, List and explain finishing defects

Information Sheet-8	Reporting Major machine or product faults

2.8 Reporting Major machine or product faults

Faults or defects in knitting and weaving production can be caused in different ways and quite a few of them cannot be related to just one cause. The following explanations are expected to be helpful in trying to locate the causes of these faults easier. During production process in textile industry machine and products faults occurring by different reasen. Same machine and products faults are listed below.

Reasons of fabric defects:

- Yarn manufacturing defects
- Fabric manufacturing defects
- Fabric processing faults or defects. Such as dyeing faults, printing faults or finishing faults.

Sources of fabric faults:

The sources of faults could be:

- Faults in yarn and the yarn package
- Yarn feeding and yarn feed regulator
- Machine setting and pattern defects
- Machine maintenance
- Climatic conditions in the knitting plant

Major Defects Found in Woven Fabric:

Various types of faults found in woven fabric has mentioned in the below:

1. Bad selvedge,
2. Broken ends or warp,
3. Broken picks or weft,
4. Loose warp,
5. Loose weft or snarl,
6. Double end,
7. Tight end,
8. Float of warp,
9. Wrong end color,
10. Miss pick,
11. Double pick,

12. Weft bar,
13. Ball,
14. Hole,
15. Oil spot,
16. Tails out,
17. Temple mark,
18. Reed mark,
19. Slub,
20. Thick and thin place.

List of Knitting Faults Found in Knitted Fabric:

Knitted fabric faults are very different in nature and appearance and are often superimposed. The following knitted fabric defects are found in knitted fabric production.

1. Broken ends, holes or cracks
2. Drop stitch
3. Cloth fall-out or pressed-off stitches
4. Snagging or snags
5. Tuck or double loop or stitches
6. Bunching-up
7. Vertical stripes
8. Horizontal stripes
9. Soil stripes
10. Color fly or color tinges
11. Distorted stitches or deformed or tilted loops

Major Machine faults

- Incorrect System Design,
- Wrong System Assembling,
- Erroneous Machine Operation,
- No or Untimely Maintenance,
- Inevitable Ageing, Slow and Imperceptible Corrosion,
- Capricious Wear during Normal Operation etc

Finally all machine and product faults are reported to supervisor and managers

Self-Check 8	Written Test

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

Answer the following questions

1, what are Reasons of fabric defects

2, what are Sources of fabric faults

3, list five major woven and knitted fabric defects

4, list textile machine defects

Textile Chemical Processing

NTQF Level -II

Learning Guides - 23

Unit of Competence: Applying Finishing Processes to Textile production

Module Title: Apply Finishing Processes to Textile production

LG Code: IND CHP2 M07 L03 - LG23

TTLM Code: IND CHP2 TTLM7 0819v1

LO3. Remove product and dispatch

Instruction Sheet	Learning Guide #23

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

3. remove product and dispatch
   - 3.1 Checking product quality
   - 3.2 Unloading or removing product
   - 3.3 Dispatching product
   - 3.4 Completing working area cleaning

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 Product quality.
- Unload or remove Product from finishing area according to specifications.
- Dispatch Product.
- complete Cleaning

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7.
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 quality

Introduction:

Quality means customer needs is to be satisfied. Failure to maintain an adequate quality standard can therefore be unsuccessful. But maintaining an adequate standard of quality also costs effort. From the first investigation to find out what the potential customer for a new product really wants, through the processes of design, specification, controlled manufacture and sale.

Quality of fabric

Quality is very important for all types of fabric and textiles. There are some important topics given blow about quality of fabric

Quality Parameters of Woven, Knitted and Non-woven Fabrics:

Generally to test the quality parameters of woven, knitted and non-woven fabric, the fabric must be conditioning at 24 hours in the standard testing atmosphere. It is very important for all types of fabric.

Quality Parameters of Woven Fabrics:

There are some quality parameters of woven fabric.

1. Dimensional characteristics:

- Length
- Width
- Thickness.

2. Weight of fabric:

- Weight per unit area.
- Weight per unit length.

3. Fabric strength and extensibility:

- Tensile strength.
- Tearing strength.

4. Threads per inch of fabric:

- Ends per inch.
- Picks per inch.

5. Yarn count:

- Warp count
- Weft count.

6. Crimp:

- Warp crimp
- Weft crimp.

7. Handle:.

- Stiffness
- Drape.

8. Crease resistance and crease recovery.
9. Air permeability.
10. Abrasion resistance.
11. Water resistance.
12. Shrinkages.
13. Different fastness properties:

- Fastness to light.
- Fastness to wash.
- Fastness to perspiration.
- Fastness to Rubbing.

Quality Parameters of Knitted Fabrics:

There are some quality parameters of knitted fabric.

1. Strength and extensibility.
2. Course density.

3. Wales density.
4. Lop length.
5. Elasticity.
6. Deformation.
7. Grams per square meter (G.S.M)
8. Yarn count.
9. Design.

Quality Parameters of Non-woven Fabrics:

There are some quality parameters of non-woven fabric

1. Strength and extensibility of fabric.
2. Weight.
3. Thickness.
4. Air permeability.
5. Crease resistance.
6. Stability of washing.
7. Stability of dry cleaning.
8. Dimensional stability.
9. Elasticity.

Some test for quality control textile finishing:

1. Shrinkage Test
2. GSM Test
3. Tensile Test
4. Tearing Test
5. Color Fastness Test
6. Rubbing fastness Test
7. PH Test
8. Shade Matching Test
9. Fabric Width Test

Self-Check -1	Written Test

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

Answer the following questions

1, define quality

2, what are Quality Parameters of Woven Fabrics

3, what are Quality Parameters of Knitted Fabrics

4, what are Quality Parameters of Non-woven Fabrics

5, list quality control textile finishing

Information Sheet-2	Unloading or removing product

Introduction:

Unloading is the activity performed after finishing is completed. During this activity, the finished fabric get-rid off or removed from the specific finishing machine. The finished loaded fabric can be unloaded from finisher machines in different forms. For example either in fiber forms. Yarn forms or fabric form.

- To conduct unloading operations without interference from adjacent activities, mobile machinery, equipment, and employees, a designated area will be established where practical.

- The designated area will be clearly marked and sign-posted as a restricted area.
- All employees operating within the confines of this area must wear a high-visibility vest or like clothing, which clearly delineates them from other employees.
- record amount of product
- record the quality of product against to standard specification.

Figure: Fabric forms package Figure: Yarn forms package

Generally during unloading any finished textile samples, care must be taken.

Self-Check -2	Written Test

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

Answer the following questions

1. List down the three different package forms dyed materials to be unloaded. (3 points)

2. describe what is unloading of dyed yarns or fabrics? (1 points

Information Sheet-3	Dispatching product

Introduction

Dispatching is the physical handing of a manufacturing order to the operating facility (a worker) through the release of orders and instructions in accordance with a previously developed plan of activity (time and sequence) established by the scheduling section of the production planning and control department.

Dispatch function in production management executes planning function. Dispatching ensures that the plans are properly implemented. Dispatch function determines, by whom the job shall be done and it co-ordinates production. It is the key point of a production communications system. It creates a direct link between production and sales.

Dispatcher transmits orders to the various shops. A dispatcher is familiar with the productive capacity of each equipment. He always keeps an eye over the progress of orders which move at different speeds on different routes.

Dispatching aspects which have to be taken care of:

A. All production information should be available beforehand.
B. Various order cards and specification drawings should be ready.
C. Equipment's should be ready for use.
D. Progress of various orders should be properly recorded on the Gantt charts or display boards.
E. All production records should be properly maintained.

Dispatch function may be centralized or decentralized.

In a Centralized dispatch system:

A central dispatching department, orders directly to the work station. It maintains a full record of the characteristics and capacity of each equipment and work load against each machine. The orders are given to the shop supervisor, who runs his machines accordingly. In most of the cases, the supervisor can also give suggestions as regards loading of men and machines under him.

A centralized dispatching system has the following advantages:

- A greater degree of overall control can be achieved.

- Effective co-ordination between different facilities is possible.
- It has greater flexibility
- Because of urgency of orders, changes in schedules can be affected rapidly without upsetting the whole system.
- Progress of orders can be readily assessed at any time because all the information is available at a central place.
- There is effective and better utilization of manpower and machinery.

In a Decentralized dispatching system:

The shop supervisor performs the dispatch factions. He decides the sequence of handling different orders. He dispatches the orders and materials to each equipment and worker and is required to complete the work within the prescribed duration.

In case he suspects delay, with due reasons, he informs the production control department.

A decentralized dispatching system has the following advantages.

a) Shop supervisor knows best about his shop; therefore, the work can be accomplished by the most appropriate worker and the machine.
b) Elaborate reports and duplication of postings can be avoided
c) Communication gap is reduced
d) It is easy to solve day-to-day problems
e) It keeps the natural urge of a section to be self-sufficient.

The advantages of a centralized system, more or less give an idea about the disadvantages of the decentralized system and vice versa.

Self-Check -3	Written Test

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

Answer the following questions

1. Define what is dispatching? (1point)

2. What is the function of dispatching in production management? (1point)

3. List down the aspects of dispatching which have to be taken care of it! (5points)

4. List down the advantages of centralized dispatch system! (6points)

5. List down the advantages of decentralized dispatch system! (5points)

Information Sheet-4	Completing working area cleaning

Introduction

In all areas of all properties there are many items and surfaces to be cleaned and Maintained. It is important as a cleaner that you know exactly what items are to be Cleaned and how.

What is cleaning?

Cleaning is the removal of all visible soil in an approved way with the use of Mechanical and chemical action or both, so that all areas are cleaned and sanitized to a high standard.

Identify all items that will need to be cleaned

Considering all working areas previously identified we need to identify all Items and surfaces in those areas that will need to be cleaned.

- Working Floor
- Textile machineries
- Areas around machine
- Tools and equipments used to preparation and production

Frequency of cleaning

Once you have established which items and surfaces need to be cleaned, we then need to decide how often these areas will need to be cleaned.

The following terms must be understood when defining frequency:

Daily clean - These are tasks that need to be done at least once daily. Some areas and items will need to be cleaned several times per day e.g. Public toilets

Task of the day - The supervisor may instruct you on a specific task of the day that requires extra attention

Weekly clean - These are areas or items that need to be cleaned weekly. This may be Scheduled on certain days of the week

Team Cleaning - This means that there will be a team of people each with their own Task working in the same area at once

Periodic cleaning - Tasks that are done on a regular periodic .This cleaning will be planned and may involve at times using e

Self-Check 4	Written Test

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

Answer the following questions

1, What is cleaning?

2, What are items that will need to be cleaned

3, List Frequency of cleaning

Textile Chemical Processing

NTQF Level - II

Learning Guides - 24

Unit of Competence: Applying Finishing Processes to Textile production

Module Title: Apply Finishing Processes to Textile production

LG Code: IND CHP2 M07 L04 - LG24

TTLM Code: IND CHP2 TTLM 0819v1

LO4. Complete records

Instruction Sheet	Learning Guide #24

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

LO4. Complete records

4.1 Completing production records and other documentation

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 –

1.Production records and other documentation are accurately completed

Learning Instructions:

1) Read the specific objectives of this Learning Guide.
2) Follow the instructions described in number 3 to 7.
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.
3 Accomplish the “Self-check 1” **in page -.**
4 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).
5 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.
6 Submit your accomplished Self-check. This will form part of your training portfolio

Information Sheet-4	completing production records and other documentation

These documents and records should be stored in official files and remain accessible to staff who need them. Base the documents on the prerequisite programs and on the product protection . If documents are already being kept, review them to make sure they are complete and that they follow the necessary standards.

Follow these three general principles to develop records and documents:

1. **Keep it short and simple**. Use bullet points and flow diagrams instead of long sentences and lengthy paragraphs.

2. **Clarity is important**. Step-by-step instructions are easily understood.

3. **Use a standardized, consistent format**. Although different programs may need different documents and records, using a similar approach will help staff learn quickly.

All finishing products record and documented in organization. The records may be includes

1. Type of products

2. Finishing machinery

3. Type chemicals using production process

4. Maintenance schedule

5. Machine productivity/efficiency

6. Quality of product against to standards

7. Record OHS practice and risk assessment against to specification

8. Record quality criteria and type of customers.

9. Report to appropriate personnel's. Appropriate personnel's may include supervisor or managers

Self-Check 1	Written Test

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

Answer the following questions

1, list three general principles to develop records and documents

2, what are products record and documented in organization

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