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MINISTRY OF LABOR AND SKILLS

Textile Processing Technology
Level – II
TVET CURRICULUM
BASED ON MARCH, 2022, CURRICULUM VERSION I

MODULE TITLE: Using Specialized Machinery to Assist Textile processing Production

MODULE CODE: IND TPT2 M08 2622

NOMINAL DURATION: 70 Hours'

Prepared By: Ministry of Lobar and Skill

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ACRONYMS

SOPs	Standard operating procedures
WHS	work health and safety
PPE	personal protective equipment
LAP	learning activity performance
IND	industrial development
TPT	Textile Processing Technology

Introduction to the Module

The word "textile" when it comes to your mind reflects on fabric that has been woven. Textile production is no simple task. A global industry making equipment and machines that are essential all over the world. It is not surprising that many products, which we use

or need, are made from fabric, with the help of this machinery. The textile industry is large and has a huge demand, because of its impact on our lives. However, have you ever wondered how does an industry produce all of the products we want and need? Well, there are **specialized machines** to get a finished product. A wide variety of machines is used by the textile industry to sew fabrics and make clothes, carpets and other textile goods. Ranging from massive heavy-duty industrial machines to small consumer-sized sewing machines**,** these are greatly in size and used by people for their own personal projects, in factories and solely in major textile factories. Every industry have machines separately involving fiber/yarn/ thread production and few for the textile production.

This module is designed to meet the industry requirement under the Textile Processing Technology occupational standard, particularly for the unit of competency: using specialized machinery to assist textile-processing production.

This module covers the units

- job requirements
- specialized machine operation
- specialized machine
- complete work

Learning objectives of the Module

At the end of this session, the students will able to:

- Determine job requirements
- Prepare for specialized machine operation
- Operate specialized machine
- Dispatch completed work

Module Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test”

Unit one: job requirements

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

- ✓ Standard operating procedures (SOPs)
- ✓ work health and safety (WHS)
- ❖ Hazard identification and control
- ❖ Risk assessment
- ❖ Implementation of risk reduction measures
- ✓ Identifying job requirements
- ✓ Using personal protective equipment (PPE)

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Standard operating procedures (SOPs)
- Work health and safety (WHS)
- Appropriate personal protective equipment (PPE)
- Job requirements from specifications, drawings, job sheets or work instructions is identified

1.1. Standard operating procedures (SOPs)

It is a set of step - by step instructions compiled by an organization to help workers carry out complex routine operations. This is to achieve efficiency, quality output and uniformity of performance.

SOP can be defined as a step-by-step written procedure about how to do a job that gives the desired result and maintains consistency in results. SOP can also be defined as a checklist for the user (operator) who is going to do a particular job. An SOP is a sure success method of doing a job.

More than just written instructions SOP can be also made using illustrations and flow charts. For some processes factory only needs to provide detailed instructions to perform a task, where some processes required instruction as well as decision-making based on the result of intermediate steps.

In manufacturing, SOPs should be in-place for:

- Equipment startup and operation
- Equipment set up and change over
- Product assembly
- Inventory tracking
- Material ordering
- Material receiving
- Maintenance procedures
- Material processing (e.g., mixing, batching)
- Quality control

1.2. Work health and safety (WHS) requirements

Work health and safety (WHS), also known as occupational health and safety, involves managing risks to the health and safety of your workers and workplaces.

The model WHS laws aim to protect the health and safety of workers and harmonize the WHS laws in Australia. The model WHS laws include the model WHS Act, the model WHS Regulations and the model Codes of Practice.

Occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards. Health has been defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or

infirmity. Occupational health is a multidisciplinary field of healthcare concerned with enabling an individual to undertake their occupation, in the way that causes least harm to their health. Health has been defined as It contrasts, for example, with the promotion of health and safety at work, which is concerned with preventing harm from any incidental hazards, arising in the workplace.

The intent behind the Occupational Safety and Health topic area is to prevent diseases, injuries, and deaths that are due to working conditions. Work-related illnesses and injuries include any illness or injury incurred by an employee engaged in work-related activities while on or off the worksite

What you must do WHS

- ✓ Provide a safe work environment.
- ✓ Provide and maintain safe machinery and structures.
- ✓ Provide safe ways of working.
- ✓ Ensure safe use, handling and storage of machinery, structures and substances.
- ✓ provide and maintain adequate facilities

The focus in occupational health is on three different objectives

1) The maintenance and promotion of workers' health and working capacity;
2) The improvement of working environment and work to become conducive to safety and health and
3) Development of work organizations and working cultures in a direction, which supports health and safety at work, and in doing so promotes a positive social climate and smooth operation and may enhance productivity of the undertakings.

1.2.1 Hazard identification and control

Hazard is something that can hurt you at workplace or has the potential to hurt you. There are hazards in every type of job and every type of workplace. Everyone at the workplace may it be workers, managers and the employer, have to share responsibility to identify and control hazards.

In the first step, worker has to recognize what a workplace hazard is (or could be) and how to report it to the employer. Also For employers, the first step is to inform workers of potential hazards, to have control systems in place to decrease the risk of injury.

A hazard in Textile Industry are varied and encompasses many aspects, like hazards related to machinery, handling of materials including chemicals, use of pressure vessels, fire hazards and overall working environment.

Types of Hazards

1. **PHYSICAL HAZARDS** Heat, cold, noise, vibration, temperature, humidity, radiation (non-ionization), improper ventilation
2. **CHEMICAL HAZARDS** Dust, dyes, vapors, sparks, gases, solvents, antimicrobic agents, flame-retardants metals and their alloys.
3. **BIOLOGICAL HAZARDS** due to contact with living organisms or their by-product (e.g. molds, bacteria, HIV, grain dust). Anthrax, which causes tetanus, bacteria and various bloods borne disease.
4. **MECHANICAL HAZARDS** Slipping out of a wet work environment, objects, such as moving machine parts and tripping hazards, hit workers.
5. **ERGONOMIC HAZARDS** Improper manual material handling method, poorly designed work practices and tasks, long sitting, unsafe work places, continuous work
6. **PSYCHOLOGICAL HAZARDS** Various aspects of work organization (system) such as increased workload, night shift, and no employee motivation, work cycle, over time
7. **ELECTRICAL HAZARDS** Improper ear thing and isolation, usage of the old wire, high voltage and contact with live electrical equipment's in, fire

1.2.2. Risk assessment

A risk assessment is a process to identify potential hazards and analyze what could happen if a hazard occurs.

Modern occupational safety and health legislation usually demands that a risk assessment be carried out prior to making an intervention. It should be kept in mind that risk management requires risk to be managed to a level, which is as low as is reasonably practical

This assessment should:

- ❖ Identify the hazards
- ❖ Evaluating and prioritizing risks
- ❖ Deciding on preventive action
- ❖ Taking action
- ❖ Monitoring and reviewing

1.2.3 Implementation of risk reduction measures

Functional safety systems and describes those safety measures that are based on sensors and control systems and are designed to ensure the safe working of machines. The term "machine" can be defined as an assembly of linked parts or components joined for a specific application—in particular, for the processing, treatment, moving, or packaging of a material. Any hazard has a risk. This risk will be reduced by using different mechanisms. These mechanisms include Standard operating procedures, Personal protective equipment, Safe materials handling, Housekeeping, Reporting accidents and incidents, Environmental practices. These are explained as follow.

Proper material handling offers benefits for

- ✓ improving productivity
- ✓ increasing the handling capacity
- ✓ reducing man-power
- ✓ increasing the speed of material movement
- ✓ reducing materials wastage
- ✓ promoting easier and cleaner handling

1.3 personal protective equipment (PPE)

Personal protective equipment refers to protective clothing, helmets, goggles, or other equipment is designed to protect the wearer's body from injury or infection. The hazards prevented by protective equipment include physical, electrical, heat, chemicals, biohazards and air born particulate matter.

Head Protection

Protective hats for head protection against impact blows must be able to withstand penetration and absorb the shock of a blow.).The following types

Type 1 - helmets with full brim, not less than 1 and 1/4 inches wide;

Type 2 - brimless helmets with a peak extending forward from the crown

Foot and Leg Protection

Safety shoes should be sturdy and have an impact-resistant toe. In some shoes, metal insoles protect against puncture wounds.

Figure 1Eye and Face Protection

Suitable eye protectors must be provided where there is a potential for injury to the eyes or face from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation, or a combination of these. Every protector shall be distinctly marked to facilitate identification of the manufacturer.

Figure 2 Arm and Hand Protection

Workers in many roles may come into contact with substances or conditions that pose a risk of harm to their hands or arms. If you cannot reduce these risks in some other way, you must use personal protective equipment (PPE)

Types of hand and arm protection

- ✓ gloves
- ✓ gauntlets
- ✓ mitts
- ✓ cuffs

1.4 Identify job requirements

Job requirements are “must haves” that an employer is looking for in a candidate for a certain job position. Job requirements are not just a list of specific qualifications, education, knowledge and skills needed for a particular position. They are a great

opportunity to show case you are Employer Brand and company culture and attract the best candidates!

Job requirements are used to communicate employer's expectations from job seekers. By laying out clearly defined job requirements, employers can attract the right type of candidates.

Common job requirements

Every position has different requirements, depending on the industry, how technical the work is and how competitive the job market is. Here are the most common types of job requirements you may see:

- Work experience
- Skills
- Education
- Professional licenses, accreditations and certifications
- Specific knowledge
- Personal traits and attributes
- Languages

Self-check-1

I. short Answer question

Instruction: write short answer for the given question. You have 10 minute for each question and each point has 3 Points.

1. ———————— Also known as occupational health and safety, involves managing risks to the health and safety of your workers and workplaces.

2. _____ Refers to protective clothing, helmets, goggles, or other equipment is designed to protect the wearer's body from injury or infection.
3. _____ can be defined as a step-by-step written procedure about how to do a job that gives the desired result and maintains consistency in results
4. _____ is a process to identify potential hazards and analyze what could happen if a hazard occurs

II. long Answer question

Instruction: write long answer for the given question. You have 20 minute for each question and each point has 3 Points.

5. List out the four type of lay out
6. Write Types of Hazards
7. What are the Common job requirements

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit two: specialized machine operation

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

- ✓ Laid out work pieces or materials in sequence
- ✓ Set up or prepare work area, bench or seating
- ✓ Prepare and adjust specialized machine

Identify & document activities

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- ✓ Laying out work pieces or materials in sequence
- ✓ Setting up or preparing work area, bench or seating
- ✓ Preparing and adjusting specialized machine
- ✓ Identifying & documenting activities

2.1 Laying out work pieces or materials in sequence

Introduction

Laying out or layout means the process of transferring a design or pattern to a work piece, as the first step in the manufacturing process. It is performed in many industries or hobbies although in the repetition industries the machine's initial setup is designed to remove the need to mark out every individual piece or

It is a method of placing and arranging the pattern (following the grain direction) on fabric in the most economical manner to minimize the length of fabric being consumed (as the length of the fabric equals to money).

Four Main Types of Plant Layout

Product or Line Layout: If all the processing equipment and machines are arranged according to the sequence of operations of the product, the layout is called product type of layout. In this type of layout, only one product of one type of products is produced in an operating area. This product must be standardized and produced in large quantities in order to justify the product layout.

Process or Functional Layout: The process layout is particularly useful where low volume of production is needed. If the products are not standardized, the process layout is lower desirable, because it has creator process flexibility than other. In this type of layout, the machines and not arranged according to the sequence of operations but are arranged

according to the nature or type of the operations. This layout is commonly suitable for non- repetitive jobs

Fixed Position Layout This type of layout is the least important for today is manufacturing industries. In this type of layout the major component remain in a fixed location, other materials, parts, tools, machinery, man power and other supporting equipment's are brought to this location

Combination Type of Layout: Now a day in pure state any one form of layouts discussed above is rarely found. Therefore, generally the layouts used in industries are the compromise of the above-mentioned layouts. Every layout has certain advantages and limitations. Therefore, industries would to like use any type of layout as such. Flexibility is a very important factory, so layout should be such, which can be molded according to the requirements of industry, without much investment. If the good features of all types of layouts are connected, a compromise solution can be obtained which will be more economical and flexible.

Objectives for Plant Layout

a) To produce better quality of products.

b) Maximum utilization of floor area.

c) To reduce internal transport from one operation to the next as much as possible.

d) Lighting and ventilating.

e) Lower cost of scrap and waste.

f) Fewer accidents.

g) Minimizing production delays.

h) Space for future expansion.

i) Safety of equipment and personal.

j) Better working conditions for both executive and operative employees.

k) Avoidance of unnecessary change.

l) Saving of cost.

m) Easy supervision.

n) Neatness.

o) Proper production control.

p) To eliminate waste effort for speeding of production

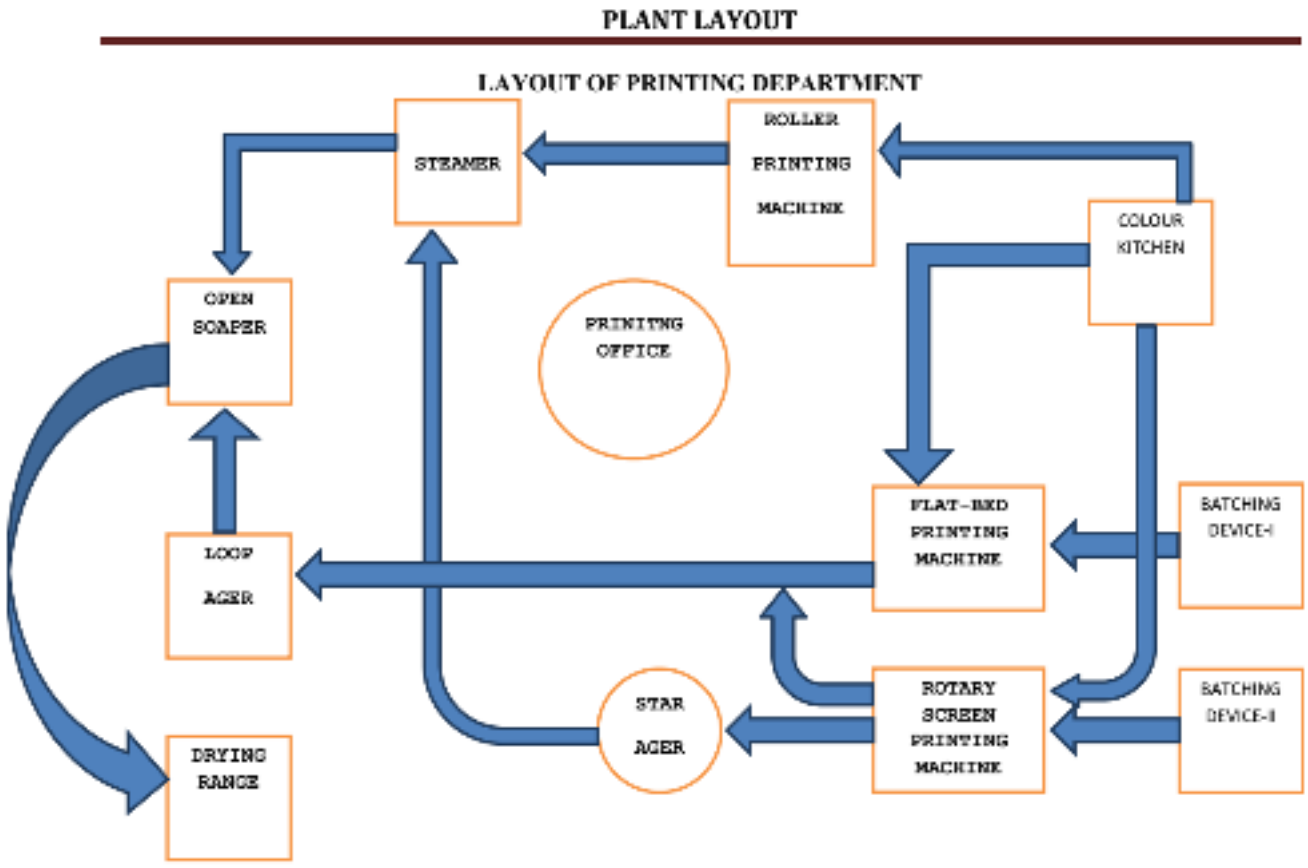

Figure 3 layout of printing department

2.2 Setting up or preparing work area, bench or seating

Work area, an area on which you focus when you perform a task

How you layout your work area will determine the safety and efficiency of your people. The layout and design of a workspace will determine the flow of people, materials, and equipment.

Layout planning is deciding on the best and most efficient arrangement of all physical resources that will need space in a work area or a facility. It can include desks, work centers, cabinets, equipment, and types of machinery. Layout planning is not only done when a new work area or facility is designed, it is also necessary when there is a change in the needs or placement of resources. A new machine may be brought in, or an existing

machine may need to be transferred. A change in operational procedure may also entail new layout planning.

Design with safety as your top priority.

The layout and design of your work area must incorporate safety principles, to mitigate the risk of injury and fatalities. A safe design begins at the early development of a structure or a work area and must be integrated into every decision-making steps such as:

- Design and intended purpose of the work area.
- Materials that will be used.
- Choice of construction methods and maintenance operation.
- Standards and codes that must be complied with.

From the pre-design stage to concept development, design options, design synthesis, through to completion, safe design must be incorporated in every step. A designer must know how to include safe design in every design phase effectively.

Safe design has many benefits, for both the employer and the employees.

- ✓ Preventing work-related injuries and illnesses.
- ✓ Improving the efficiency and usability of the work area and the facility.
- ✓ Improving the productivity of the workers.
- ✓ Reducing costs.
- ✓ Improving management of production, as well as operational costs.
- ✓ Complying with laws.
- ✓ Promoting innovative ways of thinking.

Costs due to unsafe design can be significant, and may include:

- ✓ Retrofitting and redesign of a hazardous work area.
- ✓ Compensation for injured workers.
- ✓ Insurance levies.
- ✓ Negligence claims.

Figure 4 Design with safety as handling

2.2.1 Safe storage of equipment

Storage equipment is used for holding or buffering materials over a period. The design of each type of storage equipment, along with its use in warehouse design, represents a trade-off between minimizing handling costs, by making material easily accessible, and maximizing the utilization of space (or cube). If materials are stacked directly on the floor, then no storage equipment is required, but, on average, each different item in storage will have a stack only half-full; to increase cube utilization, storage racks can be used to allow multiple stacks of different items to occupy the same floor space at different levels. The use of racks becomes preferable to floor storage as the number of units per item requiring storage decreases. Similarly, the depth at which units of an item are stored affects cube utilization in proportion to the number of units per item requiring storage.

2.3 Preparing and adjusting specialized machine

Preparing is the action or process of making something ready for use or service or of getting ready for some occasion, test, or duty.

Adjusting means

- To adapt or conform oneself (as to new conditions) adjust to the new regulations our eyes gradually adjusted to the darkness.
- To achieve mental and behavioral balance between one's own needs and the demands of others

Machine Adjustment Form

An organization, machinery / equipment is primary requirements of the any manufacturing unit that need to timely inspection and its required parameters are checking and adjustment required to ensure the products quality and parameters are maintained.

Machinery / equipment parameter adjustment form is the requirements of the production people that recording of each activities are taken by the engineers for the machinery parameters & adjustment to set up the machinery and its parts to maintain quality of product and minimize scrap or wastage in the manufacturing unit and individual machinery.

For the machinery adjustment form format, some fields those records as below

1. **Original parameter setting –** machine original setting parameters / adjustment current setting are need to recording that before testing and success of the new adjustment there are possible to reset as default that original parameter / adjustment setting required to records.
2. **Planned Parameters –** machine engineers are thought for the adjustment of the machine that some planned as record to ensure the new-planed adjustments will be work as requirements.
3. **Adjusted setting –** Machine adjustments are done as per planned & original parameters, adjustment current setting recording in this form. Adjustment setting is records to future requirements.
4. **Reason for Adjustment setting –** machine adjustment and its requirements are noted in this format, reason that each parameter changed is records should be must maintain. Each reason should be important in line with parameter changed.

2.4 Identifying & documenting activities

Identifying equipment means creating an equipment master. Entering detailed information. Searching for equipment information. Locating parent and component information

Objectives

- To create equipment master information
- To create supplemental equipment information
- To locate equipment information
- To access other programs from an equipment identification program
- To review parent and component relationships and history online
- Types of Equipment Identification Information

Equipment identification consists of four types of information:

- Equipment master
- Supplemental data
- Specification data
- Message logs

A documentation activity means actions, such as mitigation of potential impact, undertaken for recovering data about or from archaeological sites to evaluate and determine significance or to document through archaeological excavation, the archaeological site, fully or by means of representative samples.

Documentation is any communicable material that is used to describe, explain or instruct regarding some attributes of an object, system or procedure,

How to Document Processes

Step 1: Identify and Name the Process

Step 2: Define the Process Scope

Step 3: Explain the Process Boundaries

Step 4: Identify the Process Outputs

Step 5: Identify the Process Inputs

Step 6: Brainstorm the Process Steps

Step 7: Organize the Steps Sequentially

Step 8: Describe who is Involved

Equipment documentation is necessary to ensure maintenance management, repair work, manufacture of spare parts, rapid troubleshooting, work safety,

Equipment documentation can include maintenance logs, warranties, insurance paperwork, accounting data, and user manuals. Any data you need to save if you own the equipment. Connecting the documents to the piece of equipment allows you to have everything in one place

Self-check-2

I short Answer writing

Instruction: write short answer for the given question. You are provided 10 minute for each question and each point has 3 Points.

1 Write down at least three types of plant layout?

2 Write down at least 5 objectives for Plant Layout

II: **multiple choose question**

Instruction: choose the best answer form the given alternative. You are provided 10 minute for each question and each point has 2 Points.

1 _____ process layout is particularly useful where low volume of production is needed

A. Process or Functional Layout C. Product or Line Layout

B. Combination Type of Layout D. Combination Type of Layout

2 _____ is necessary to ensure maintenance management, repair work, manufacture of spare parts, rapid troubleshooting, work safety

A. Identifying equipment C. Equipment documentation

B. Adjusting D. Laying out

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit three: SPECIALIZED MACHINE

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

- ❖ Operate specialized machine
- ❖ Check and adjust specialized machine

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- ➢ Operating specialized machine
- ➢ Checking and adjusting specialized machine

3.1 Definition of Operating specialized machine

The textiles industry is a globalized trade that encompasses several aspects of cloth goods: design and production of natural and synthetic fabrics; spinning and dyeing of cotton, yarn, and other fibers; importing and exporting products; and much more. Textile products are highly versatile and are commonly used for personal apparel and home furnishings.

The majority of the industry focuses on manufacturing, which can be accomplished through sewing and weaving different materials together. Depending on the specific end use, several products are crafted with specialized machines (which use freestyle, pattern, or other techniques). Due to consumer demands, these machines have advanced greatly in recent years. Like other modern industrial machines, textile machines often rely on boiler and compressor systems as well as chemical and condensate lines. Before start of production, the pressure on the left, right and center of the rollers shall be checked by means of the lightweight woven fabric strips. One of the strip shall be passed through the machine press and while holding the other end tight. When the end passes out of the press, the strip will be pull to feel the pressure of the rollers. The conveyor belts shall be checked. If there is any adhesive residue contaminating the belts, it will rub off with a soft cloth. The cover of the cleaning bars will be Turn or changed, depending on how dirty they are. The scraper blades will be cleaned with a cloth. Once the Fusing machine is ready for operation, the inter-lining will be set in proper position of the fabric, the appropriate time will be set and a test run through the machine will be made.

3.1.1 Jet dyeing machine

Jet dyeing machine is the most modern machine used for the dyeing of polyester fabric with disperses dyes. In these machines, both the fabric and the dye liquor are in motion,

thereby facilitating a faster and more uniform dyeing. In jet dyeing machine, there is no fabric drive reel to move the fabric.

A machine used for dyeing of fabric in rope form. Jet dyeing machines came into existence with a purpose to minimize or eliminate the drawbacks of earlier machines like winch, jigger and beam dyeing units

Principle of the Technology

Jet dyeing is a process that can be used for batch dyeing operations such as dyeing, bleaching, washing and rinsing. In this process, dyeing is accomplished in a closed tubular system, composed of an impeller pump and a shallow dye bath. The fabric to be dyed is loosely collapsed in a form of a rope, and tied into a loop. The impeller pump supplies a jet of dye solution, propelled by water and/or air, which transport the fabric within the dyeing system, surrounded by dye liquor, under optimum conditions. Turbulence created by the jet aids in dye penetration and prevents the fabric from touching the walls of the tube, thus minimizing mechanical impact on the fabric.

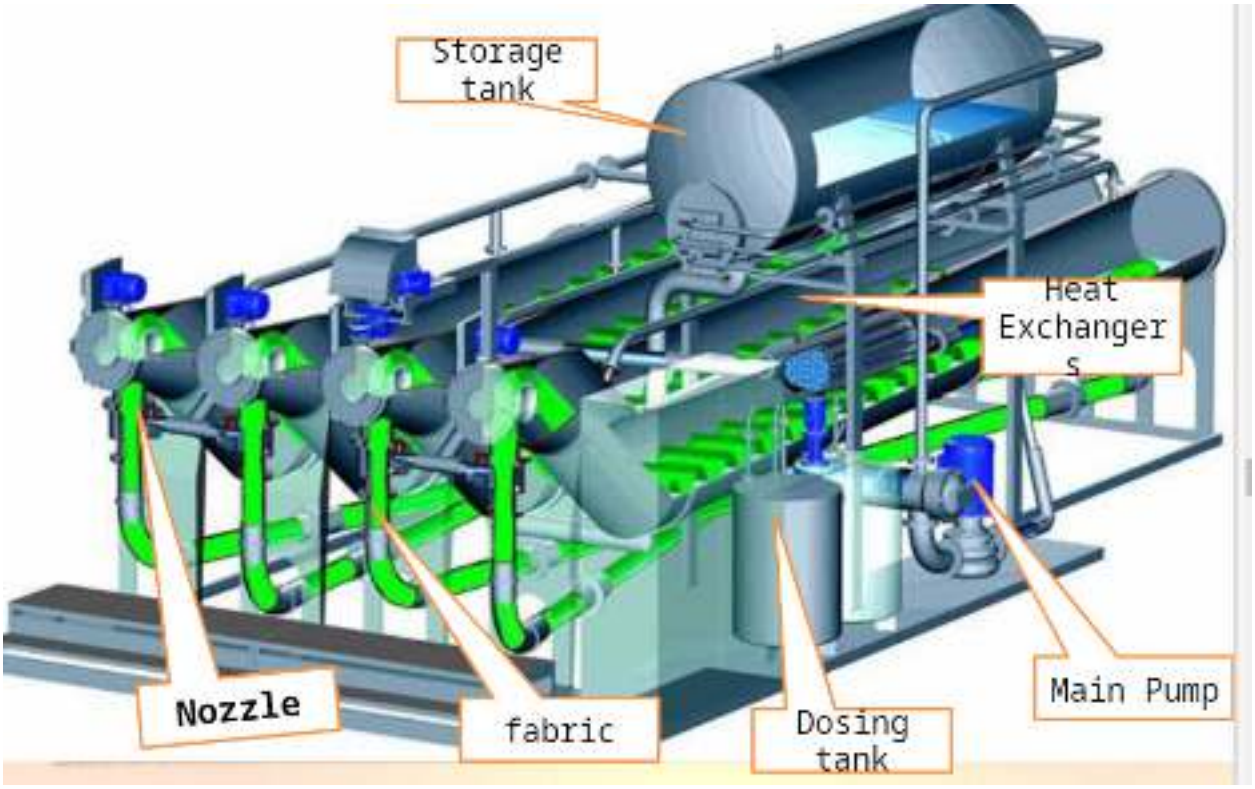

Figure 5 jet dyeing machine

Special Features and Applications

1. Jet dyeing machines can be operated even at high temperatures and pressures. Jet dyeing systems are fitted with cooling systems with the potential for reuse of the warmed water on the next dyeing cycle.

2. Jet dyeing systems operate at a low liquor ratio, or the ratio of the mass of the dye bath to the mass of the fabric in the dyeing machine. Compared to conventional dyeing, typically with a liquor ratio of 1:15 to 1:25, jet dyeing can be operated at a liquor ratio from as low as 1:3 up to 1:6. Consequently, the dyeing operation consumes less water and chemicals, and generates less effluent.

3. Since the dying process depends on dye concentration, the lower liquor ratio increases the dyeing rate and dye fixation.

4. Increased dyeing rate results to quicker machine drains and fills, and more rapid heating and cooling. The latter decreases energy requirements for heating the dye bath, which then leads to reduced steam and boiler use, reduced fuel consumption, and fewer emissions to the atmosphere from combustion.

5. The lengthwise tension is less, widthwise tension is absent and fabric achieves better fullness and handle.

6. The frequent movement of fabric round the jet through the machine reduces the tendency of crease formation.

Limitations of Jet Dyeing machines

1. High Initial investments and maintenance cost.
2. Limited accessibility during the dying process.
3. Foam forming substances are to be avoided.
4. Any roughness of the inside surface cause damage to cloth.
5. In case of cloth breakage, rethreading is complicated.

Types of Jet Dyeing Machines

The following type of jet dyeing machines were developed,

1. Over flow dyeing machines
2. Soft flow Jet dyeing machines
3. Air flow-dyeing machines

MACHINERY PROCESS

1.The solution is filled in the dye tank and it reaches the heat exchanger where solution can be heated which then pass onto the centrifugal pump and then to the filter chamber.

2. The solution will be filtered and reaches the tubular chamber. Here the material to dye will be loaded and the winch is rotated so that the material is also rotated.

3. Again the dye liquor reaches the heat exchanger and operation is repeated for 20-30 minute 135°C.

4. Then dye bath is cooled down, after material is taken out

3.1.2 Labelling machine

Textile products must be labeled or marked whenever they are put onto the market for production or commercial purposes. Where these products are not being offered for sale to the end consumer, or when they are being delivered in performance of an order placed by the State, labeling or marking may be replaced by accompanying commercial documents. The names, descriptions, and details of textile fiber content must be indicated in these commercial documents. They must also be indicated on products

Offered for sale to consumers. The labeling of textile products harmonizes the names of textile fibers and other terms used in labeling or other documents accompanying these products, in order to ensure adequate information for consumers and to promote the

Brand label: It plays an important role in labeling as it gives information about the brand. It can be removable or non-removable.

Descriptive label: It specifies product usage.

Grade label: It describes the aspect and features of the product.

Functions of Labeling

Recognition of product: Labeling assists in the identification of the product. Example, the brand name of a chocolate will help one choose from the rest of the confectionery items available.

Assorting of products: It means classification or grading of products according to different categories in the market. Example, shampoos are categorized as dry hair, normal hair and oily hair types and cater to consumers in the market with the dry, normal and oily scalp, respectively.

Assists promotion of products: It gives the customer the reason to purchase the product. Example, it attracts the attention of the consumer by displaying messages such as '20% free' or 'save rupees 15' message in potato chips packet.

In compliance with the law: Labels should strictly abide by the law. Example, for tobacco, the label should mention 'Tobacco is injurious to health'. Cigarettes also should have 'Smoking is injurious to health' as the statutory warning on its package

Figure 6 Textile Labels Machine

3.1.3 Cutting machine

Cutting Machine is used for cutting out parts of articles from layers of cloth card webs or knitted fabric. The technically possible depth of cutting of the layer depends on the design of the cutting machine and on the thickness and properties of the fabrics. Cutting machines may be movable or stationary. Textile Cutting Machine Setters, Operators, and Tenders refer to such workers who operate cutting machines and other equipment used in cutting textiles according to specified patterns. In this role, they study the specifications of a given textile product to determine the tools and techniques suited to cutting the product. they also routinely inspect the cutting machine to ensure that it functions properly. A part of their job is to identify any malfunctions or faults with the machinery. they also perform repair and maintenance activities to make sure that the malfunctions are resolved in a timely way the cutting machine may be classified in three categories**.** Such as-

- **Manual cutting machine**

We can understand scissor as a manual cutting machine. Scissor only used when cutting only single or double plies. Almost every type of cloth is cut by scissor. However, it takes huge time for fabric cutting. So it is not used in bulk production

- **Semi- Automatic cutting machine**

Straight knife cutting machine is the most popular and versatile cutting machine. It is widely used in clothing industry. Because it's production speed is very high. Higher lay of height can be cut very easily. Besides, knife is comparatively cheap and can be transferred from one place to another easily.

Figure 7 Semi- Automatic cutting machine

- **Fully Automatic / Computerized cutting machine**

This cutting machine provides the most accurate possible cutting at high speed. It is suitable for large scale production. Marker is not necessary to put over the fabric lays during cutting. This technology has the advantage of being highly accurate and fast, but does cost considerably more than other cutting techniques

Figure 8 Fully Automatic / Computerized cutting machine

3.1.4 Metro digital textile printer machine

METRO is a truly advanced industrial grade 1.8 meters wide digital fabric printing machine which fantastically incorporates the latest technology and efficient engineering to meet the ever-growing demands of the textile business. As a digital textile-printing consultant, Color Jet offers a high-speed fabric-printing machine that is compatible to work with all types of inks like reactive, acid, disperse, and pigment. This industrial textile printer weaves magic on a variety of fabrics, ranging from 0.1 mm to 30 mm including cotton, polyester, silk, viscose, wool, nylon, acetate, or any other blended fabric. This high-speed digital textile-printing machine from Indian textile printing leaders, Color Jet provides comprehensive textile printing solutions.

The brilliance that is METRO is built on a rigid structure to support 8 & 16 head combination for long service life and deliver high-quality prints with speeds reaching upwards of 362 sq. meters per hour. The independent fabric feed module comes with a spreader roll to help remove wrinkles if any. This high-speed digital textile-printing machine has a dancing roll and a guide roll to feed fabric with even tension. This reactive printing machine is equipped with water jets and a brush roller to wash off excess ink and lint. The infrared dryer system incorporated in the Metro machine makes sure of efficient radiation for minimal dissipation of heat to surroundings. This industrial textile printer has

an advanced degassing and de-bubbling feature that avoids head blockage during high-speed printing.

The most popular type of digital textile printing machine is the METRO. It has a high-speed print head and is equipped with sophisticated color processing tools. It prints on a wide range of fabrics and supports all types of inks. Its high-end print head is capable of achieving image resolutions of up to 2000 dpi. Further, its design and features make it easy to use for any type of textile printing business

In addition to the above, the METRO has a high-speed fabric-printing machine. It has a wide range of fabrics and advanced color management tools. Its user-friendly color controls make it convenient to operate. It also has a built-in color-control system. It has several features that help it meet the demands of any textile business. Aside from a high-speed print head, it can also handle several types of fabrics. It is an affordable option for small-scale textile businesses.

The METRO is a high-speed digital fabric-printing machine. It has an advanced color management engine and user-friendly color controls. A versatile machine can print on different kinds of fabrics. It can be used for home decoration and high-end garments. Its nozzles can print on a wide range of materials, including plastics, rubber, and textiles. The METRO also has an automatic color-control system.

The METRO is a high-speed digital fabric-printing machine with advanced color management tools. It is capable of printing on a wide range of fabrics. The METRO also supports multiple file formats and is compatible with many different types of inks. Its multifunctional printer can print on different types of fabric. A few examples of this type of digital printing machine are listed below. If you are looking for a commercial-grade inkjet printing machine, the ColorJet METRO is an excellent choice.

Process flow:

1 Order received from the buyers or clients

2 Scanning of design and design development
3 Fabric preparation
4 Printer setting
5 Printing
6 Curing or Dye fixing
7 Final washing

APPLICATIONS

METRO, a digital fabric printing machine addresses various market segments such as fashion apparels (Women's, Men's, and Kids clothing), home furnishings (Curtains, Bed sheets, Sofa Covers), etc. This digital fabric-printing machine is used to print Shirts, Skirts, Scarves, and Sarees. METRO prints on Cotton, Viscose, Polyester, Polyamide, Silk, and Wool and is suited for the production of high-quality products as well as home decoration fabrics.

Figure 9 Metro digital textile printer machine

3.1.5 Dosing system

Chemical dosing system is a complete set of equipment with dosing, mixing, transporting liquid and automatic control. It is also called chemical feed system or dosing machine.

The chemical dosages in the textile plant are adapted to special productions in order to optimize the different processes and to achieve a great impact on the quality of the final product.

Industry 4.0 has revolutionized industrial processes in the modern era. Thanks to the automation of these processes, textile plants are able to generate great savings based on optimized calculations and specific processes that help us to obtain greater performance without sacrificing quality.

Large companies such as the Inditex Group, Mango, HM, Nike, New Balance, Primark, among many others, closely monitor sustainable production, demanding very high standards of quality and traceability of the final product. For this reason, we work to find precise solutions for those dyeing and finishing processes.

We know in advance that finding the balance between performance, quality and sustainability is complex, but not impossible.

3.1.5 .1 Color dosing system

Techno Mix is the dosing machine and color kitchen where powder solutions are safely prepared.
It has a pump module connecting to the conical preparation tanks, built in stainless steel for longer life. The interior of Techno mix is finished in mirror effect, with practically no elements, designed to obtain the best possible mixture.
This system also allows us to perform an automatic and efficient washing of the machine, making it available for the next mixing in a matter of minutes.
Tecno Mix achieves the perfect dissolution and mixing based on the recipe, and the preset parameters such as mixing time, water temperature or agitation method. By scanning the barcode of the recipe directly into the machine, with no need to enter manual parameters.
An alarm system alerts us when to introduce the colorant just scanning the barcode of the powder previously prepared. The security system will open the safety lid to introduce the water-soluble bag and the mix process according to the parameters in the recipe will begin.

Techno mix offers the following advantages:

- Optimal and precise dissolution of the dye considering the parameters of time, temperature, and agitation method.

- A modular and expandable system able to grow according to the production capacity.
- Lid opening by sophisticated safety system.
- Configurability and great adaptability to the different technical requirements of the recipe and dye family.
- Traceability and transparency of the process.
- Latest generation technology thanks to the Atlantis PCT-900 controller.
- Full connectivity to Info Tint, and other MES software in the market.

3.1.6 Batcher for fabric rotation

Batching is the process where inspected grey fabrics are divided into different batches with reasonable quantity according to machine capacity, nozzle number in order to make them suitable for the further operation in batching. It must be carefully observed that each nozzle of a machine contains equal length of fabric. Batching process in textile industry is **a** preparatory stage for dyeing. Generally, batching is the receiving section of grey fabric and sending section of grey fabric to the dyeing section , which will dye. Batching is the process to get ready the fabrics,

Figure 10 Fabric batching machine

Batch Processing Flow Chart:

Flow chart of batching process in textile industry is given bellow:

Receive batch card from Grey In-charge

↓

Make the priority as per dyeing plan

↓

Take one specific Batch card

↓

Read the Batch Card for own understanding

↓

Check the availability of fabric

↓

Take required quantity of body fabric from ware-house

↓

Make required no. of Rope maintaining equal length

↓

Take collar/cuff as per size, keep the total weight

↓

Distribute the collar/cuff or Rib in each rope equally unsure equal length

↓

Stitch the fabric

↓

Write down the weight against roll no. in the backside of the Batch Card

↓

Write the total weight in Batch card

↓

Put signature and date.

↓

Fill up the production report form

Types of Batch:

1. Solid batch / non-assort batch: same diameter
2. Rational batch / Assort batch: various diameter

1. Solid batch:

This type of batch is prepared randomly to the total amount of fabric.

2. Rational Batch:

This type of batch is prepared according to the ratio of number of nozzle the fabric diameter and structure.

Functions and Purposes of Batch Section:

1. To receive the grey fabrics roll from knitting section or other source.
2. Make a batch plan manually, keeping in mind the process losses which would take place along production route (e.g. dyeing process loss, cutting loss etc.).
3. Grey fabrics are weighted for ensuring the actual size.
4. To turn out the tubular fabric to safe the face side of the fabric from any type of friction during dyeing.
5. To prepare the batch of fabric for dyeing according to the following criteria-
   - Order sheet (Receive from buyer)
   - Dyeing shade
   - M/c available
   - Type of fabrics (100% cotton, PC, CVC etc.)
   - Emergency
6. To send the grey fabric to the dyeing floor with batch card.
7. To keep records for every previous dyeing.

8. Reduce idle time of a dyeing machine.
9. Arrange the fabric for dyeing according to quantity, fiber type, fabric structure and shade.
10. Gradually reduce grey fabric inventory (which is replenished as production proceeds

Criteria of Proper Batching:

The grey fabric is sent to the dyeing floor with a batch card providing details of the fabric rolls, the processes to be carried out and the sales contract against which the process is taking place. Records are maintained for the same. The criteria for proper batching are:

1. To use maximum capacity of existing dyeing machine.
2. To minimize the washing time or preparation time and machine stoppage time.
3. To keep the no. of batch as less as possible for same shade.
4. To use a particular machine for dyeing same shade.

Considering Factors for Batching:

- Stock of grey fabric.
- Capacity of machine.
- Rope length of Fabric.
- Dwell time of fabric.
- Type of finish.
- Type of fabric
- Types of yarn
- Structure of fabric
- GSM of fabric
- Amount of fabric
- Machine type
- Machine availability
- Shade of dyeing
- Priority of work Etc.

Information in Batch Card:

- Order No
- Color

- Yarn count
- Yarn lot
- Stitch length
- Rope length
- Diameter
- Yarn brand
- Machine No
- Roll No

Batch Management:

Primarily batching is done by dyeing manager considering the above criteria. Batch section in charge receives this primary batch plan from dyeing manager. Sometime planning is adjusted according to machine condition or emergency.

3.1.7 Engraving machine /Screen preparation

3.1.7 .1 Rotary Screen Printing

The rotary screen is a screen in a cylindrical form. The color/printing paste is applied from inside while the rotary screen is revolving. The pressure of the screen and the central cylinder allows the paste to transfer onto the fabric. Because of the high quality it can achieve, rotary screen-printing is the most appealing method for printing designers and fashion apparel fabric Rotary screen printing has increased enormously in its use in recent years because of its versatility and the development of rotary screen printing machines which are capable of very high rates of production. An additional significant advantage is that heavy depths of shade can be produced by screen-printing, a feature that has always been a limitation of roller printing because of the restriction to the amount of print paste, which can be held in the shallow depth of the engraving on the print roller. Worldwide, about 61% of all printed textile fabric is produced by the rotary screen method and 23% by flat screen-printing. The most important and fundamental element of rotary screen-printing is the cylindrical screen or the engraved roller. Many companies are making these rollers for printing.

3.1.7 .2 Printing Screens

Print screens are required in order to create the desired image on the textile substrate. Each color of the image/design requires a separate screen, for example, a three-color design requires three screens, one per color. Print designs are becoming more complex, and it is

not unusual for 20 colors to be used in the design. This can be quite costly to set up since a screen is required for each color and setting up the registration of the design (print registration) can be quite time consuming.

3.1.7 .3 Rotary Screens

Lacquered rotary screens are produced in much the same way as flat screens, the only difference being that the screens are cylindrical, not flat. The mesh has hexagonal holes and is nickel coated so that it can endure the printing process. Again the design may be laser cut along the cylindrical roller for ease of screen manufacture.

Galvano rotary screens are thin inflatable nickel tubes, coated with a light-sensitive polymer. A full-length negative of the design is wrapped around the tube followed by a negative of the mesh pattern. The screen is exposed to light, washed and dried. Only the non-pattern areas and areas corresponding to the supporting mesh in the pattern have no polymer. The polymer acts as an insulator upon subsequent nickel plating, nickel only building up in areas where there is no polymer. This results in a thin nickel sheet with holes only in areas of the pattern. Below figure shows the different layers in the manufacture of a galvanic screen.

3.1.7 .4 Print Management Process:

Behind engraving, the roller there is a whole management, which decides all the process. Therefore, the things that needs to be done before engraving a Scanning Using Drum Scanner:

The customer's design art is received either as original design to be scanned or soft copy on disk. At least there should be one repeat.

Color Separation:

Scanning is processed to separate the colors making sure to reproduce the intricacies of the customer's work.

Data Send To Engraving Department:

Within the days the data is deliver as quality fabric inkjet print that perfectly interpret the customer's design to rotary screen engraving department. Changes and approvals can be made fast and economical when in the form of print rather than engraved screen.

Engraving:

After approval, engraving is done and shipment is made to the printing department or to the customer.

Responsibility of Engraving Department

In order to get the best print there are some responsibility of engraving department that are:

The Quality of File or Painted Art Submitted:

To make sure that the data, which is received, is perfectly matched to the customer's design.

The Size of the Actual Repeat

It will decide the repeats on the roller.

Screen Mesh

Mesh size is the most important thing in the screen. More the number of mesh size, finer and pretty the print will be.

Length and Engraved Width

Repeat size will decide the size of the screen

3.1.7 .5 Screen Making

Engraving of screen includes following six steps

- Unpacking
- Rounding
- Degreasing
- Washing
- Drying
- Coating
- Unpacking

The first step in the preparation of screen for engraving is unpacking of screens. Screens are usually received in a bean shaped package from which they are carefully taken out so that no dent is generated in the screen. It is advised not to keep screens in the boxes for more than a year otherwise they can cause problems in rounding process and not more than four screens should be kept on one another because weight of the screens can cause serious problems. While taking out screen from the packaging care of its dimensions are taken and we make sure that the screens are more towards rounder shape.

Rounding

In order to bring screen in round form, rounding rings are used. On both sides of screen, rounding rings are inserted and then screens are put in polymerization chamber. Polymerization process for rounding of screen is done at 180 to 200°C for 10 to 15

minutes. After polymerization, rounding rings are removed from screen. Screens packed in boxes have a little larger size then the standard one. After polymerization, screens are put over a stand then they are cut into original size through a scissor. After it, screen both ends are taped with the help of a paper tape so that no handling mark appear on screen during coating.

Degreasing

To get even coating throughout the screen degreasing of screen is done with emulsion SCR 35. Ratio is kept 1:4 which means 4 times water and 1 time emulsion. The time allowed is 5 to 10 minutes. Soft water is always used while making an emulsion.

Washing

For the process of washing showering of screen is done, 4 times from top to bottom than bottom to top with soft water. If soft water is not used than carbonates will stick to screen and that portion of screen will not polymerize.

Drying

The process of drying is carried out in dirt free room. It's advised to conduct drying at low temperature around 20°C. Clamps are always used to hold the screen.

Coating

The process of coating is usually done to close the meshes of screen. The screens are placed in cones and plate containing coating material, which moves down slowly only ones. The only two chemicals used for screen coating are SCR 102 and SCR 101. SCR 102 is the Lacquer and it is a universal emulsion. SCR 101 is a sensitizer and it is an emulsion

Recipe for coating solution is as follows:

SCR 102 1000gm

SCR 101 50gm

Water 100gm

After coating, screens are put in clamitizer; around 20 screens could be placed in one clamitizer. Coated screens are dried in clamitizer through air. 20 minutes are required for drying one coated screen. In case of using max wax jet engraving machine, screen should brought for engraving immediately after clamitizing otherwise screen will get hard. But in case of using laser jet engraving machine, after clamitizing screens are polymerized at 200°C for 1 – 1.5 hours. The polymerized screens should bring for engraving within 1

hour. The top ends of coating chamber are covered with tape otherwise, emulsion may flow inside walls of chamber. Two squeegees are always used, one for coating and other for scrapping.

Techniques of Rotary Screen Making

There are three types of engraving methods

1. Photoengraving machine
2. Max wax engraving
3. Laser jet engraving

Photoengraving Machine

It is the oldest and the most conventional way of photoengraving. Screen one end is held in cone of machine. Negative is put over screen and then according to repeat adjustment, this negative is kept over another area and so on. In this way, over 1 screen 1 negative is exposed across the entire screen length in steps. Through ultraviolet light, black area of negative is exposed over screen. After exposing, all of the max wax jet engraving processes will be followed.

Wax Engraving

In wax engraving, solid wax is melted to make designs on rollers then screen is exposed to light and after that printing screens are developed.

Procedure

The process of wax engraving consists of four steps:

1. Engraving
2. Exposing of screen
3. Developing of screen
4. Polymerization

Engraving

After coating and clamitizing, engraving is first step in wax engraving. Here the wax used is in the solid form, which starts melting due to temperature, and flow to nozzles then the design is formed.

Exposing of Screen

For exposing commonly, halogen light is used. Time of exposing varies from 2 to 7 minutes. The exposing time is depending on mesh of screen, thickness of coating, light source and image pattern.

Developing of Screen

Immediately after exposure screen is immersed in little hot water for 5 to 10 minutes .when all wax is removed clean the screen with sponge both from inside and outside till image comes out clearly. In end wash the screen with little pressurized water by pipe. Examine the screen under light if any open areas are there close it by means of brush

Polymerization- Curing by Heat

After screen is developed at room temperature it is kept in polymerize (heater) for curing. The temperature is 70-180°C for at least one and a half hour. The temperature should be constant throughout the chamber. It is desirable to turn the screen after 45 minutes.

Advantages of Wax Engraving

- The best quality screens are made in all aspects.
- Effects like sharpness of design is best achieved.

Disadvantages of Wax Engraving:

- When the wax is finished, error will occur on computer and both the screen and head will stop.
- Non-uniform temperature in polymerize causes the screen defects.
- Wax engraving is the long process especially washing.

Laser Engraving

In laser engraving, mask is applied and portions of mask are removed by laser then after the metal plating screen is formed.

Procedure:

The process of laser engraving consists of three steps:

- Application of mask
- Removing portions of mask
- Deposition of metallic material

Application of Mask:

Polymeric electrochemical resist mask or black polymeric mask is applied to cylinder. Auto-coating machine is used for coating as this machine applied the mask evenly and smoothly.

Removing Portions of Mask

The laser to make the design on screen removes the portions of mask and cylinder is exposed from where mask is removed.

Deposition of Metallic Material

Immerse the cylinder having un removed mask in nickel plating solution so areas where mandrel is exposed are filled with plating solution.

Laser Engraving Machine

The main parts of laser engraving machines are

- ❖ Shaft, which is rotatable, it rotates the screen.
- ❖ Two end ring assemblies used to fix the opposite ends of rotary screen.
- ❖ Laser engraving device including head moving back and forward along the shaft.
- ❖ Supporter is also movable and it supports that part of screen which is being engraved

Advantages of Laser Engraving:

- ✓ Laser engraving is non-contact method i.e. less wear and tear.
- ✓ This process creates permanent design.
- ✓ Today's equipment is user friendly.
- ✓ You may also like: Burn Out Print: Process, Chemicals, Costing and Uses

Disadvantages of Laser Engraving:

- ➢ Its initial cost is high.
- ➢ Sharpness of design is not as best as in wax engraving.

Modern Engraving Machines

Latest rotary engraving machines include:

- ➢ Rotary inkjet technology
- ➢ Laser exposing technology

Rotary Inkjet Technology

Rotary inkjet engraver is a digital equipment of computer-to-screen engraving. In this printing technique, design is directly coated on nickel screen with special ink and cures the resin with UV light. Comparing to traditional engraver, it saves the film cost.

Advantages of Rotary Inkjet Engraving Technology

Following are the advantages of rotary inkjet engraving technology:

- ✓ It is a fast engraving process.

- ✓ Rotary inkjet machines provide noiseless operation.
- ✓ Rotary inkjet machines consume less power.

Laser Exposing Technology

Laser exposing technology is same as laser engraving technology but the machines used in this are new and improved. It has the ability to produce high quality laser engraved rotary screens by simple and efficient means. Elimination of washing and developing of exposed screens reduces chance of error, dent and crease. Laser exposing is a single step dry process, it simply engrave the coated screen with your desired design and print. It eliminates costly consumables like film or ink, and time-consuming processes like washing.

Table 1 Comparison between Different Engraving Method

S.NO	Photo Engraving	Max Wax Engraving	Laser Engraving
1.	Engraving done using this technique is 35%	Engraving done using this technique is 60%	Engraving done using this technique is 5%
2.	Time required for engraving is 3 hrs.	Time required for engraving is 2-2.5 hrs.	Time required for engraving is 45 mins.
3.	Used for printing sharp images.	Used for geometrical designs.	Used for solid figures and floral designs.
4.	Local work is done on photo/conventional engraving machines.	Mostly export work is done on max wax engraving machines.	Mostly local work is done on laser engraving machines.
5.	Machines are manually controlled.	Machines are automatically controlled.	Machines are semi-automated.
6.	Less checking or touching required.	More checking or touching required.	Less checking or touching required.
7.	Design out problems occurred.	No design out problems occurred.	Design out problems occurred.

3.2 Checking and adjusting specialized machine

Within the textiles industry, various check and control valves are utilized in wide-ranging applications. Valve products help regulate heat from steam boilers, which is used in the dyeing and drying of cloth goods; valves are also used to provide relief to air compressors that are in constant operation.

Additionally, check and control valves can adjust liquid flow rates—in conjunction with metering pumps—to deliver precise volumes of water, chemicals, and other liquid solutions. Other applications include discharge of pumps, boilers, and compressors.

To obtain the most efficient, high-quality results, many textile professionals choose valve products supplied by DFT Inc. Axial check valves operate via a disc and spring mechanism that prohibits fluid from reversing its flow direction. When pressure builds up on one side of the disc controlled spring , the disc opens, allowing fluid to flow through the valve. However, when there is not enough pressure on the other side of the spring, the valve stays closed, preventing back flow.

These spring mechanisms reduce the risk of water hammering, which increases the valve's longevity. Valves of this type also occupy less space than manual valves and other check valves, making them easier to install in crowded environments. Axial check valves can be installed vertically or horizontally, which allows them to be used in a number of different applications.

Checklist – a simple tool for risk assessment Checklists can be useful tools as part of the risk assessment process, when they can be used to identify hazards. They can also be used in monitoring the performance of control measures. The checklist below cannot cover all hazards and risks, and readers are recommended to identify other relevant tools on the web pages of national safety and health authorities and inspectorates.

Mechanical tests are those in which textiles are subjected to different pressure and stressors, usually in specialized testing machines. These include tests to measure breaking strength, the force needed to break a fabric under tension. Such tests can ensure fabrics are strong enough to maintain integrity even when under great stress. Other tests gauge tearing strength, or the strength required to make an already existing rip or tear worse. In addition, abrasion tests determine how quickly a textile wears out when it is rubbed against another

surface. Such tests make sure that fabrics used in products like those that parachutes and car seat belts will not break when needed most to keep the user safe.

Specialized textile testing is also done to test for flammability, or how quickly a given textile burns. Various methods of performance testing are done on textiles that must possess special qualities, like be effectively bulletproof or provide a layer of filtering on construction projects. In short, there are as many ways to test textiles, as there are uses for textile products in our world.

Self-check-3

I. Short Answer writing

Instruction: write short answer for the given question. You have 10 minute for each question and each point has 3 Points.

1 _____ Is a high-speed digital fabric-printing machine with advanced color management tools?

2 _____ is same as laser engraving technology but the machines used in this are new and improved

3 _____ Is the most modern machine used for the dyeing of polyester fabric with disperses dyes.

II. Long answer writing

Instruction: write long answer for the given question. You have 15 minute for each question and each point has 5 Points

4 Compare between Different Engraving Method

5 What are modern Engraving Machines

6 Discuses working Principle of jet dyeing machine

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Operation sheet 1

OPERATION TITLE: Assisting in set-up and carry out specialized machine operation

PURPOSE:

- ❖ To train our trainees about method of assist in set up and carry out specialized machine operation
- ❖ The Machine Set-Up and Operator ensures machinery is set up, works properly, and conforms with (and can produce materials that conform with) company quality, quantity, and efficiency standards.

INSTRUCTION:

The operation process can be performed by following the procedure and steps.

EQUIPMENT TOOLS AND MATERIALS:

Workshop cutting and machining equipment, Standard operating procedures**,** Technical work activities**,** Preparation of materials and equipment

To assist in set up and carry out specialized machine operation

PROCEDURE:

1. Sets up and operates tools according to instructions, specifications, and standard charts.
2. Studies blueprints, work orders, and other specifications to ensure the proper setup sequence is followed.
3. Selects, places, and secures tools.
4. Places and secures work pieces in proper machine table, holding device, or other
5. Prepares fixtures and feeding devices, starts machine, and engages feed.
6. Observes each machine to verify quality performance.
7. Verifies measuring instruments such as gauges, calipers, and micrometers are in proper working order.
8. Sets and adjusts necessary controls to regulate machines.
9. Sharpens tools with bench grinder as needed.
10. Performs other related duties as assigned precautions
11. The operation can be performed by applying standard occupational health and safety rule.

QUALITY CRITERIA:

The final appearance of to assist in set up and carry out specialized machine operation can be checked its quality by the trainers and trainees .If there is any problem checking again and if they completed the learning outcome preparation for Assist in Set up and carry out specialized machine operation pass to next learning outcome.

Precautions:

- ✓ DO NOT expose the machine to direct sunlight, excessive heat, open/naked flames, salty or corrosive gasses, moisture, or dust.
- ✓ DO NOT put the printer near devices that contain magnets or produce magnetic fields.
- ✓ DO NOT connect your machine to an AC power outlet controlled by wall switches or automatic timers

LAP Test 1

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

1 Task 1. How to operate Jet dyeing machine

2 Task 2. How to operate Laser Engraving machine

3 Task 3. How to operate Batching textile machine

Unit four : Dispatch completed work

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

- **Dispatch completed work**
  - ✓ Checking production outputs
  - ✓ Record and report machine or product faults
  - ✓ Direct outputs
- Completing work documentation,

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Dispatch completed work
- Completing work documentation

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 workstation. It maintains a full record of the characteristics and capacity of each equipment and workload 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 labor 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.

4.1 Checking production outputs

The outputs are the end product and the income earned from it. In case of the textile industry, the inputs may be cotton, human labor, factory and transport cost. The processes include ginning, spinning, weaving, dyeing and printing. The output is the shirt you wear.

4.2 Record and report machine or product faults

Information Requirements for Senior Management and Production Managers One of the keys to the success of any management team is a well designed and timely management information reporting system. The information received by each manager should be relevant to his needs. timely. and concise. From a factory (production) management point of view. these reports can be broken into three broad categories.

1 Quality reports

2 Production and performance reports

3 Variance anal·t-test reports

three types of report should provide a comprehensive picture of the performance of an organisation. The synergy between these report types is critical.

For example. oroduction quantity reports and machine utilisation reports can be dangerously misleading unless production quality reports for the same period are also analysed. understanding of the physics and a fault-symptom-tree analysis. The sources of faults are ample and stem from one or the other from the following-

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

4.3 Directing outputs

This department performs a variety of complicated tasks and is ultimately responsible for driving the work in the field through a force dispatch process. He/she must have ability to multi-task and be able to do several things at one time. The dispatch manager is responsible for the dispatch and warehouse departments.

Checking production outputs in final check we can monitor our entire manufacturing process from sourcing the right supplier through final delivery of finished product. With quality inspectors located around all the department, with particular concentration in Factory,

Also ensures that all items produced and finished in KABEER Industries undergo rigorous inspection that ensures their degree of compliance. All defects will be reported at this stage in order to facilitate cutting and making up, but also to maximize the use of the fabric and prevent defective items being produced.

This department is having independent QA teams – who Capable of performing all major tests on product as per specifications that is, Strength, shrinkage, color performance and

other physical aspects. Internal Controls through formal Quality Management System (QMS), random audits and training.

4.4 Completing work documentation

Document and record all processes and activities. These documents and records should be stored in official files and remain accessible to staff who need them. Based on 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.

Let staff know that attempts to falsify records are easily detected. Auditors are trained to look for signs of fraud that can include records completed in the same increasingly messy handwriting and using the same pen.

Checking records regularly, helps ensure that employees are completing their assigned activities. It helps to make sure that records are being filled out honestly and with all

The information needed.

Records are an important tool for analyzing and improving safety. False records will not help improve the system or help you reach your goal of improved safety!

DOCUMENTING plans provide the documents and records needed to make sure that the system is being followed at each critical control point. Records differ slightly from prerequisite program records.

Records provide a historical report of the following:

- ✓ Process
- ✓ Monitoring procedures
- ✓ Deviations
- ✓ Corrective actions taken at each critical control point

Self-Check -4

I Long answer question

Instruction: write long answer for the given question. You have 15 minute for each question and each point has 5 Points

1 What is dispatching?

2 What are three general principles to develop records and documents

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers