

# **FASHION DESIGN TECHNOLOGY**



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# PARTICIPANT HANDBOOK



Apparel

Language:  
English

# Fashion Design Technology

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(Fashion Design Technology)

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# CHAPTER 1 HEALTH AND SAFETY

**LEARNING OUTCOMES:**

- To comply with health and safety methods
- Disposal system for waste and by-products
- Security requirements at work
- Social compliance and rights of workers

**PRE-SESSION ACTIVITY:**

The trainer asks trainees to share their experiences of not having maintained safety procedures and the consequences of such behavior. The trainees will take note of each incident and their outcomes. At the end of the discussion, the trainer will highlight each points will possible deductions.

## 1.1 Comply with health and safety

### 1.1.1 Health and Safety risks and methods

Policies and procedures provide the framework within which an organisation operates.

They define what your organisation does and how you do it.

Clear policies and procedures support effective decision-making and delegation because they provide guidelines on what people can and cannot do what decisions they can make and what activities are appropriate.

### What is the meaning of a clear policy framework?



A clear policy framework means there will be fewer misunderstandings or debates about what to do in particular situations and there will transparency and consistency in the way you operate as an organisation and make decisions.

## Learning the responsibilities under health, safety and environmental legislation

Employers have legal responsibilities to ensure a safe and healthy workplace. As an employee, you have rights and you have responsibilities for your own wellbeing and that of your colleagues.

As an employee, following points should be followed:

- To take reasonable care of your own health and safety
- If possible to avoid wearing jewellery or loose clothing if operating machinery
- If you have long hair, or wear a headscarf, make sure it's tucked out of the way as it could get caught in machinery
- To take reasonable care not to put other people - fellow employees and members of the public - at risk by what you do or don't do in the course of your work
- To co-operate with your employer, making sure you get proper training and you understand and follow the company's health and safety policies
- Not to interfere with or misuse anything that's been provided for your health, safety or welfare
- To report any injuries, strains or illnesses you suffer as a result of doing your job, your employer may need to change the way you work
- To tell your employer if something happens that might affect your ability to work, like becoming pregnant or suffering an injury. Because your employer has a legal responsibility for your health and safety, they may need to suspend you while they find a solution to the issue or problem, but you will normally be paid if this happens
- If you drive or operate machinery, you have a responsibility to tell your employer if you take medication that makes you drowsy. If you have, they should temporarily move you to another job if they have one for you to do

### 1.1.2 Identifying Potential Hazards

- Safeguards are essential for protecting workers from needless and preventable machinery-related injuries.
- Mechanical equipment, tools, and other machinery has the potential to pose several hazards to users including, pinch points, wrap points, shear points, crush points, pull-in points, and the potential for objects to be thrown from the equipment.
- The point of operation, as well as all parts of the machine that move while the machine is operating, must be safeguarded.
- Environmental Health and Safety have established programs to guide employees in working safety and guarding physical hazards.
- Every precaution must be undertaken to provide a safe workplace.
- Your company should make regular inspections and holds regular safety meetings.
- They should also meet with management to plan and implement further improvements in the safety program.
- Common sense and personal interest in safety are still the greatest guarantees of your safety at work, on the road, and at home.

**a. Safety rules and guidelines**

To ensure your safety, and that of your co-workers, please observe and obey the rules and guidelines appropriate to the general populace or specific jobs:

- Observe and practice the safety procedures established for the job.
- In case of sickness or injury, no matter how slight, report at once to your supervisor. In no case should an employee treat his or her own or someone else's injuries or attempt to remove foreign particles from someone else's eye.
- In case of injury resulting in possible fracture to legs, back, or neck, or any accident resulting in an unconscious condition, or a severe head injury, the employee is not to be moved until authorized personnel have given medical attention.
- Do not wear loose clothing or jewellery around machinery. It may catch on moving equipment and cause a serious injury.
- Never distract the attention of another person, as you might cause him or her to be injured. If necessary to get the attention of another person, wait until it can be done safely.

**1.1.3 Disposal System for Waste and By-Products**

**Waste Management**

- In garment industries waste is purchased raw material that is subsequently not sold as product.
- If ones reduces the amount of waste the company produces it will increase profits and help the company to remain competitive.
- Many manufacturers accept waste as a normal cost of business.
- Fabric Store Inspection of the incoming fabric is very important.
- The fabric which is sourced from outside into the fabric store should also be inspected for the defects.

**Wastes in the Cutting Room**

Wastes in the cutting room can come from several sources including marker utilization, cutting waste and roll remnants.

**Wastes in the Bundling Room**

If the inspection is not 100%, some defective pieces go undetected and reach the stage of production.

**Wastes in the Production Floor**

The loaders load the lines with the bundles that pass on the line according to the operation. The operator may find the piece defective at any stage and dispose it off there and then only.

**Wastes in Dyeing and Washing**

The wastages happen when the pieces are either lost or misplaced during the transportation.

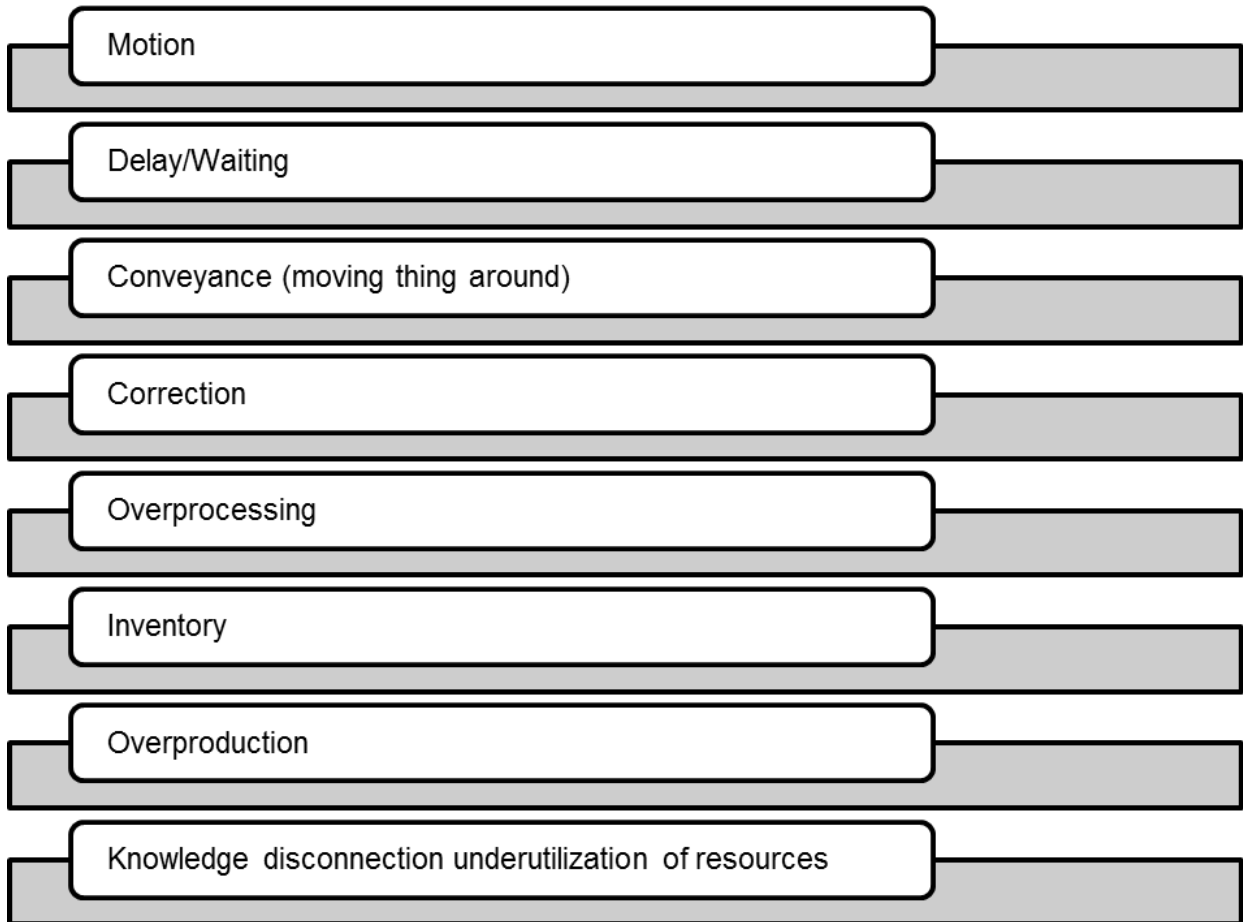
### Wastes in Printing/Embroidery

The printing on the garment does not match the standard

In the case of embroidery, it may not be at the correct place on the garment or the number of threads used is less and desired effect is not obtained. Finishing this may include measurement/fit defect, trims defect, or pressing.

#### 1.1.4 Reasons for Wastage

Main Causes of Wastage are identified due to:



## Wastage in Various Stages of Production

### a) Sample Production

1. Mistakes in design communication Sample production
2. Craftsmanship problems

### b) Cutting floor

1. Wrong colour or shade Cutting floor
2. Fabric faults

### c) Sewing department

1. Machine problems sewing department
2. Faulty Craftsmanship

### d) Outsourcing

1. Dying Outsourcing
2. Embroidery Problems detected

### e) Problems detected during final inspection

1. Ironing problems during final inspection
2. Measurement problems



## Improvement Methods

### i) Waste Reduction Methods

- Wastes in the cutting room
- Care in movement of work-in-progress
- Quality Control

### ii) Recommendations to reduce wastes

- Waste stream reduction for apparel manufacturers – To develop a comprehensive waste management system.
- Technique to reduce industry specific waste.
- To handle specific operational wastes



**iii) Measures to control cost lost in wastage**

- Finish in time
- Minimum changes in original design
- Least make break/rework
- Keep check on labour and Material costs
- Avoid rework due to bad quality
- Optimize usage of materials
- Enhance labour productivity through skill training
- Efficient Management Information System (MIS) for timely decision making

**1.2 Security requirements at work**

**1.2.1 Safety Health and Regulation**

External companies must apply general health and safety principles.

- Systematic risk analyses and measures favouring collective protection over individual protection, for instance, shall be required.



- All staff must be qualified for the tasks to be carried out, be medically fit and have up-to-date training.
- Employees assigned to high-risk tasks must be medically fit for the risk(s) involved and, where applicable (electrician, forklift truck operator, cherry picker operator, etc.), in possession of written authorisation from their employer.
- Any lending of equipment must be subject to a prior written procedure between the various parties concerned.
- Suitable tools and equipment that are Environment of Care (EC) compliant and in good condition (including extinguishers and marking devices)
- Decent, clean work clothing, suited to the tasks to be carried out.
- Personal Protection Equipment (PPE) that is EC-compliant, suited to the tasks to be carried out and the work area (footwear, goggles, harnesses, etc.).

### Order, cleaning up and waste management

Systematically put in place signs and notices in the appropriate areas, to be removed immediately after the work has been completed. Workers shall at least once a day and in any event at the end of their shift:

- Clean their work areas and dispose of all waste
- Tidy away tools and materials to ensure that no obstructions are caused
- Waste must be collected and sorted in accordance with the relevant regulations

### Delivery and storage

- Requirements must be indicated as soon as possible and the storage areas must be determined in advance with the EIB link person.
- Chemicals (including paint, thinners, etc.) must be stored in labelled containers that are in good condition, as provided for in the regulations. Liquids must be placed in holding tanks.
- Data sheets must be provided to Security, via the EIB link person, before the items arrive on site.
- Waste must be stored in suitable containers.
- Storage must not obstruct passageways or emergency exits.
- Gas cylinders must be transported and stored in accordance with the rules (valve caps, trolley or rack, etc.).

### Handling and lifting

- Mechanical handling shall be preferred to manual handling. Before any handling operation, find out about permissible loads and observe them.
- Lifting machinery (cherry pickers, forklift trucks, etc.) must have up-to-date operating permits and have been subject to periodic checks. A copy of the machinery's safety register must be made available on site.



## 1.2.2 Social compliance and rights of workers

### i) Requirement of code of ethics



The code of ethics is all about the quality of the products from the factory and the working environment that should meet the requirements of audits and inspections. An individual running an export business needs to follow these ethics sincerely. These ethics are required for:

- Increasing national competitiveness in terms of social compliance
- Increasing competitiveness of small scale manufacturers
- Reducing burden on manufacturers

### ii) Working hour & wage rate compliance

1. Garment factory must ensure that employees should get at least minimum wages according to the domestic law and as per the time spent by them in the industry.
2. Employer should pay equal wages to both men and women employees, for performing the same work or work of a similar nature.
3. Worker employed for more than nine hours on any day or for more than 48 hours in any week, shall be entitled to wages at premium legal rates for such overtime work.
4. Every worker should be given one holiday (for a period of 24 consecutive hours) in a week. Whenever a worker is required to work on a weekly holiday, he is to be allowed a compensatory holiday for each holiday so lost.
5. Every worker is to be allowed at least half an hour rest interval after a maximum working of 5 hours at a stretch.



### Workplace & work environment compliance

- Organisations should ensure proper ventilation, sufficient light and air to provide the employees with standard work environment.
- Indian garment industries should provide the workers with comfortable sitting chair with back support and proper leg space.



### Non-discrimination compliance

Organizations should not discriminate employees based on physical characteristics, beliefs and cultural characteristics.

All the terms and conditions of employment should be based on an individual's ability to do the job.

They should provide equal employment opportunities for all employees and associates irrespective of the employees' race, color, religion, age, sex, creed, national origin, marital status, etc.



### 1.3 Health and Safety Compliance

Garment industry is getting increased attention from consumers, social workers, welfare organizations and branded international buyers. Many international buyers are demanding for factories to comply with their “code of conduct” before placing any order.

Nowadays, continuous adherence to quality standards and employee satisfaction has become important parameters for measuring the company’s performance.

- Enterprises undertake business compliance, not necessarily out of a need to act generously, but more so for survival in a globally competitive and legally complex modern environment.
- To meet internationally recognised standards, it is essential for the suppliers to improve safety and health compliance code and provide proper working environment in their factories.
- Regular practice of compliance codes of conduct can bring higher price of products, less employee turnover rate, smooth industrial relation as well as global image & reputation.

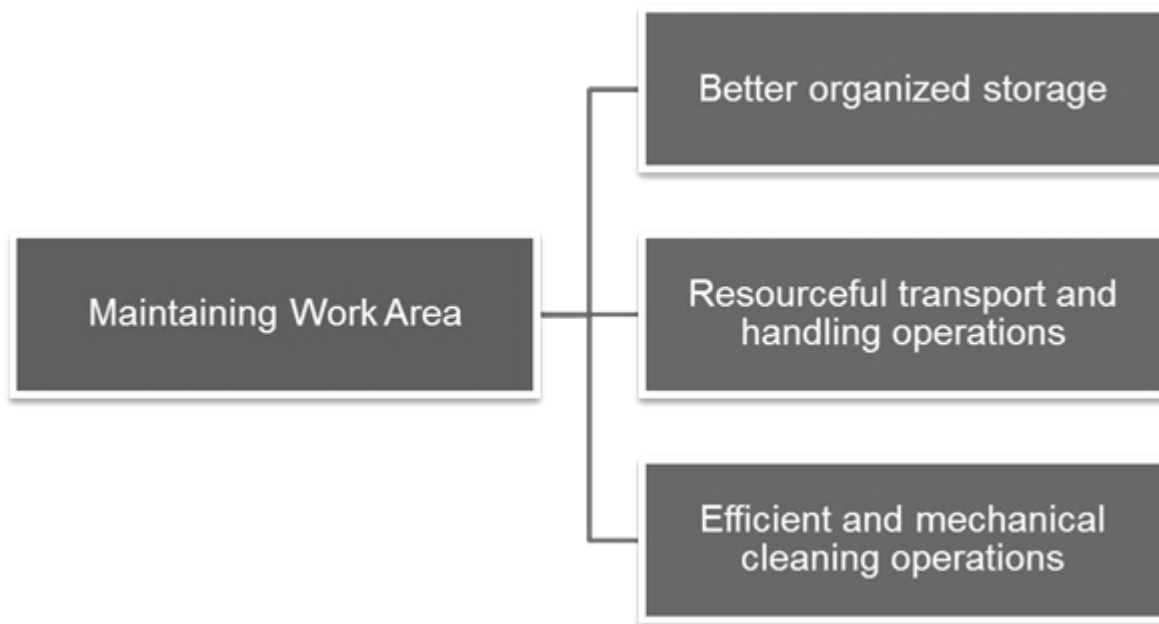
#### Maintain work area

#### Efficient material storage and handling



The storage and handling of raw materials, components and products is an integral part of most production processes. Done efficiently, it can ensure that work flows smoothly and helps to avoid delays and bottlenecks.

However, storage and handling are not sources of additional value or profit, as during these operations, goods do not acquire any new qualities. Just the opposite happens: materials are damaged and lose their value, accidents occur and the scarce capital is tied up in unnecessary stock.



The above goals help in achieving numerous benefits, which includes:

- Recovery of space for production
- More efficient materials flow
- Faster capital turnover
- Improved inventory control
- Reduction of time lost on unproductive work
- More orderly and attractive factory

**a) Better Organized Storage**

Extra stock can become waste. It requires storage space, provisions for record keeping and additional handling expenses. It ties up capital and some costly materials can become spoiled or obsolete. It affects movement of workers, clutters shop floor and leads to wastage of time when workers spend valuable productive time looking for things.

Some of the most organized enterprises manufacturing garments practise a specialized inventory method known as "Kanban" or "just-in-time." The basic principle is that materials are brought to the production area only as and when they are needed. This helps with stock control. If you want to compete, you should be willing to try the same idea.

**Other important points to remember are:**

Avoid placing materials on the floor	
Avail use of multi-level racks	
Providing storage for each tool and work items	

**b) Fewer , shorter and more efficient transport and handling operations**

Every time a worker handles a work item, he / she loses out on time and energy. Analyse your work operations and see whether each handling operation is really justified. If not, find a way to eliminate it. The number of handling operations is closely related to the number of different tasks in the production process. It is also related to the order in which machines and workstations are placed around the shop. This is part of the overall organization of production and layout of your workshop.

**Providing appropriate place for frequently used tools, such as:**

- ✓ scissors
- ✓ nippers
- ✓ tape
- ✓ measures
- ✓ threads
- ✓ needles
- ✓ zippers
- ✓ buttons
- ✓ lace



These should be made available within easy reach of the worker. Most used tools can be attached to the worktable, supplies can be stored in small bins or boxes above, or below the worktable, and small accessories can also be placed in small boxes or on special feeders.

Less frequently used tools and supplies can be placed on shelves and racks next to the workstation or in a corner within the production area. Finally, tools that are needed only once or twice in a day can be stored centrally in the storeroom.

**Providing Appropriate Container for Operation Outputs and Input**

Various types of containers and aids are required to keep the suitable needs. Consider the following for selecting appropriate containers:

- Size and weight of bundle/garment pieces
- Space requirement for moving and stocking containers
- Durability
- Means of transportation
- Cost effectiveness.

Other specific design criteria for containers need to be taken into consideration if you want to achieve an efficient system of production:

- Material, weight and size
- Handles
- Colours, labels or tags
- Modularity and the possibility of stacking.



### Clear and Mark Passageways

Very often movement of handling equipment is hampered by items scattered on the floor or by protruding containers and boxes.

- If the passageways are marked and cleared, then handling equipment can pass through easily and quickly, saving time and energy.
- Each workstation should keep its containers within well-defined boundary lines.
- Keeping only necessary items within the work place will help keep passageways clear.



### Fewer and More Efficient Heavy Lifting Operations

In small garment, industries there are many handling and lifting tasks. Lifting operations are a prime source of accidents, damage and unproductive costs, and it is better to eliminate them wherever possible. Lifting loads is usually combined with transport and the following rules will help to make this safer and more productive.



**a. Don't lift loads higher than necessary**

Time and physical effort can be saved by using platforms so that goods do not have to be lifted during loading and unloading operations. Provide material handling devices to reduce carrying before loading and after unloading.



- Minimize lifting
- Provide good handles
- Keep the load close to the body
- Don't twist to pick up or put down a load
- Handle things between hips and chest level
- Handle only light objects above or below this level
- Minimize bending or difficult reaching.



**Steps to lift weight:**

<p><b>1</b></p> <ul style="list-style-type: none"> <li>● Get close to the object</li> <li>● Gloves may improve grip</li> <li>● Ensure loads are lightweight</li> <li>● Avoid lifting from the floor</li> </ul>	<p><b>2</b></p> <ul style="list-style-type: none"> <li>● Bend at the waist</li> <li>● Use both hands</li> <li>● Have a good grip</li> </ul>	<p><b>3</b></p> <ul style="list-style-type: none"> <li>● Keep close to body</li> <li>● Push up with legs</li> <li>● Use forearms &amp; thighs to rest load</li> </ul>	<p><b>4</b></p> <ul style="list-style-type: none"> <li>● Get help, if needed</li> <li>● Keep it tucked in</li> <li>● Pivot with your feet, not your back</li> </ul>
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**a. Make lifting more efficient and safer**

- Manual lifting of heavy loads should be avoided. Manual lifts should be considered only as a last resort when mechanical aids are not available.
- When allocating tasks, consideration should always be given to the physical capacity of the least strong workers involved in the operation.
- In organizing lifting work, remember that lowering and raising the body weight when taking weights up from the floor increases the required energy by 50 per cent as compared with lifting a weight from 0.5 metres above the floor.
- Where possible install platforms for loading and unloading heavy items.
- Dividing bundles into smaller parts before moving them should not be associated with lower productivity. It has been proved in practice that maximum efficiency is usually attained with weights below 20 kilograms.
- The physical capacity of a woman is on average about one-third lower than that of a man and her reach is also considerably shorter; this should be taken into account when assigning jobs which require lifting heavy weights, especially above shoulder level.

Where possible, do not assign heavy lifting jobs to women and ensure that pregnant women do NOT lift heavy weights.

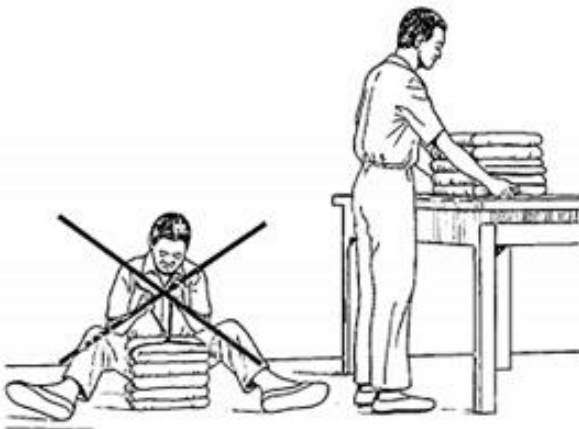


Figure 1 Workers should be discouraged from working on the floor. Their backs suffer and their productivity is low. Stable work tables and stools should be provided

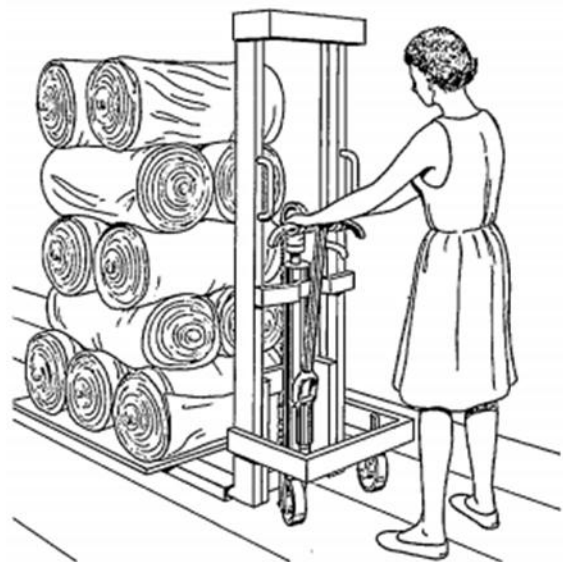


Figure 2 : A low-lift pallet trolley is reliable, safe and easy to operate for carrying heavy loads a short distance with minimum elevation

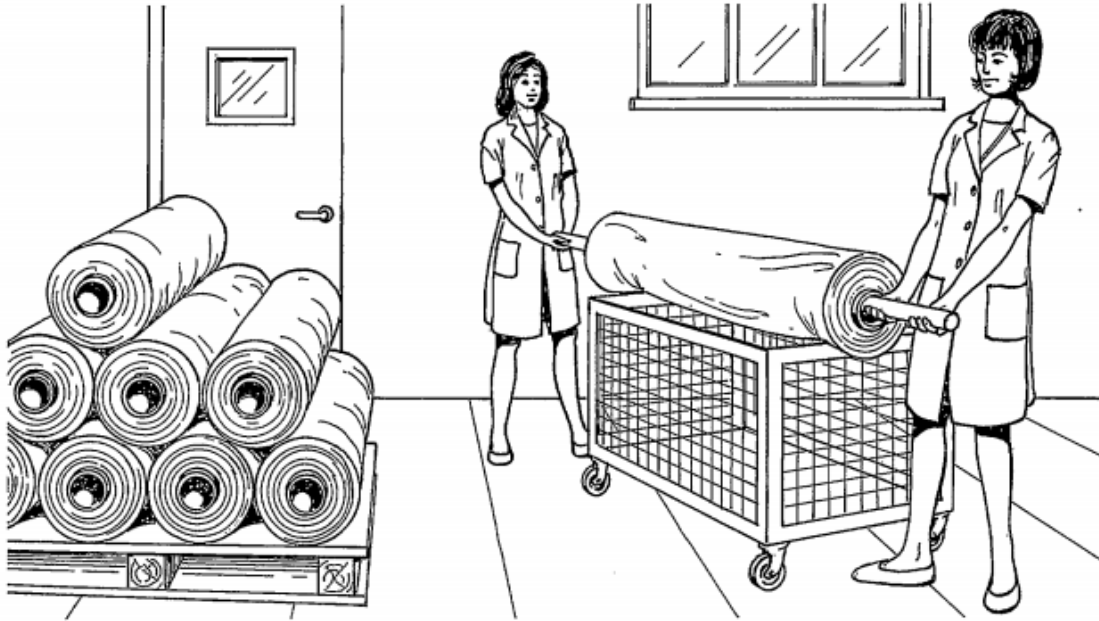


Figure 3 : Heavy and bulky rolls of cloth can easily be handled and carried using one long rigid bar and a multi-purpose trolley. Alternatively, you can use two shorter wooden bars, inserting one in each end of the roll

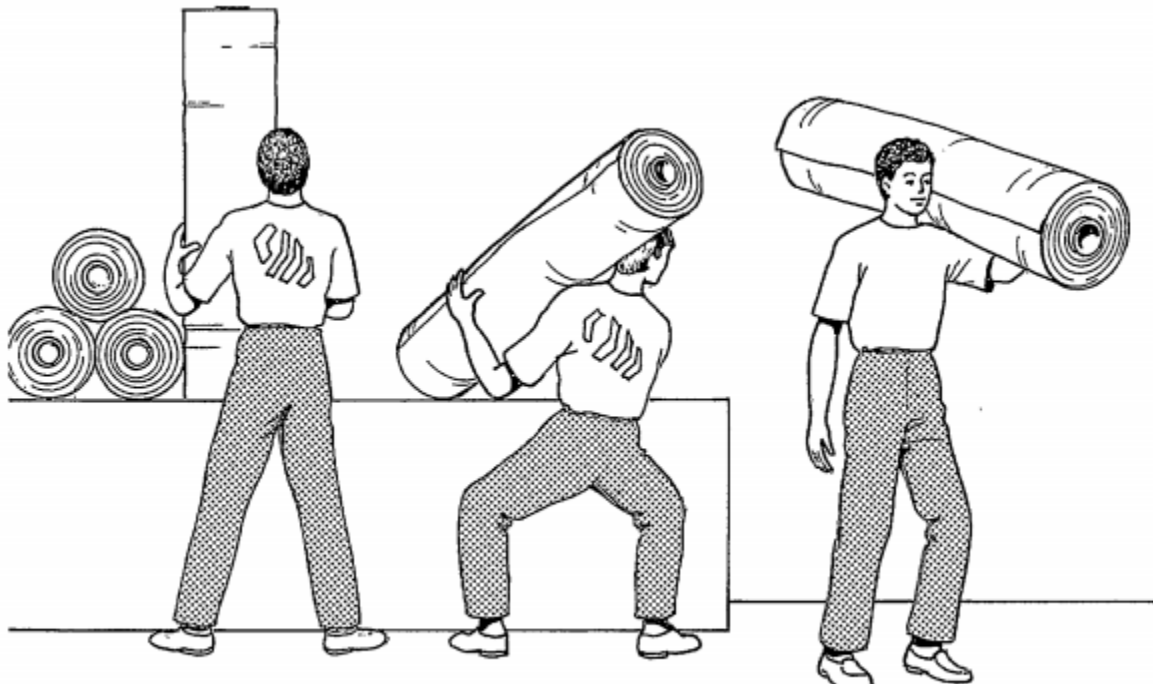


Figure 4 : The correct technique for lifting heavy rolls from a platform. The higher the level of the roll above the floor, the less energy is required

**Safety Rules and Guidelines to be Maintained**

- To ensure your safety, and that of your co-workers, please observe and obey the rules and guidelines appropriate to the general populace or specific jobs:
- Observe and practice the safety procedures established for the job.
- In case of sickness or injury, no matter how slight, report at once to your supervisor. In no case should an employee treat his or her own or someone else’s injuries or attempt to remove foreign particles from someone else’s eye.
- In case of injury resulting in possible fracture to legs, back, or neck, or any accident resulting in an unconscious condition, or a severe head injury, the employee is not to be moved until authorized personnel have given medical attention.
- Do not wear loose clothing or jewellery around machinery. It may catch on moving equipment and cause a serious injury.
- Never distract the attention of another person, as you might cause him or her to be injured. If necessary to get the attention of another person, wait until it can be done safely.
- Where required, you must wear protective equipment, such as goggles, safety glasses, masks, gloves, hairnets, etc. appropriate to the task.
- Safety equipment such as restraints, pull backs, and two-hand devices are designed for your protection. Be sure such equipment is adjusted for you.
- Pile materials, skids, bins, boxes, or other equipment so as not to block aisles, exits, fire fighting equipment, electric lighting or power panel, valves, etc. Fire Doors and Aisles Must be Kept Clear!
- Keep your work area clean.
- Observe “No Smoking” regulations.
- Shut down your machine before cleaning, repairing, or leaving it.
- Only authorized personnel should operate tow motors and lift trucks and no one but the operator is permitted to ride the tow motors.
- Running and horseplay are strictly forbidden in the work areas.
- Do not block access to fire extinguishers.
- Do not tamper with electric controls or switches.
- Do not operate machines or equipment unless you have the authorization to do so.
- Do not engage in such other practices as may be inconsistent with ordinary and reasonable common sense safety rules.
- Report any unsafe condition or acts to your supervisor.
- Use designated passages when moving from one place to another; never take hazardous shortcuts (i.e., between moving equipment or across roadways).
- Do not adjust, clean, or oil moving machinery.
- Keep machine guards in their intended places.
- Clean up spilled liquid, oil, or grease immediately.
- Wear hard-sole shoes and appropriate clothing (i.e., shorts or mini dresses are not permitted).
- Place trash and paper in proper containers and not in cans provided for cigarette butts.



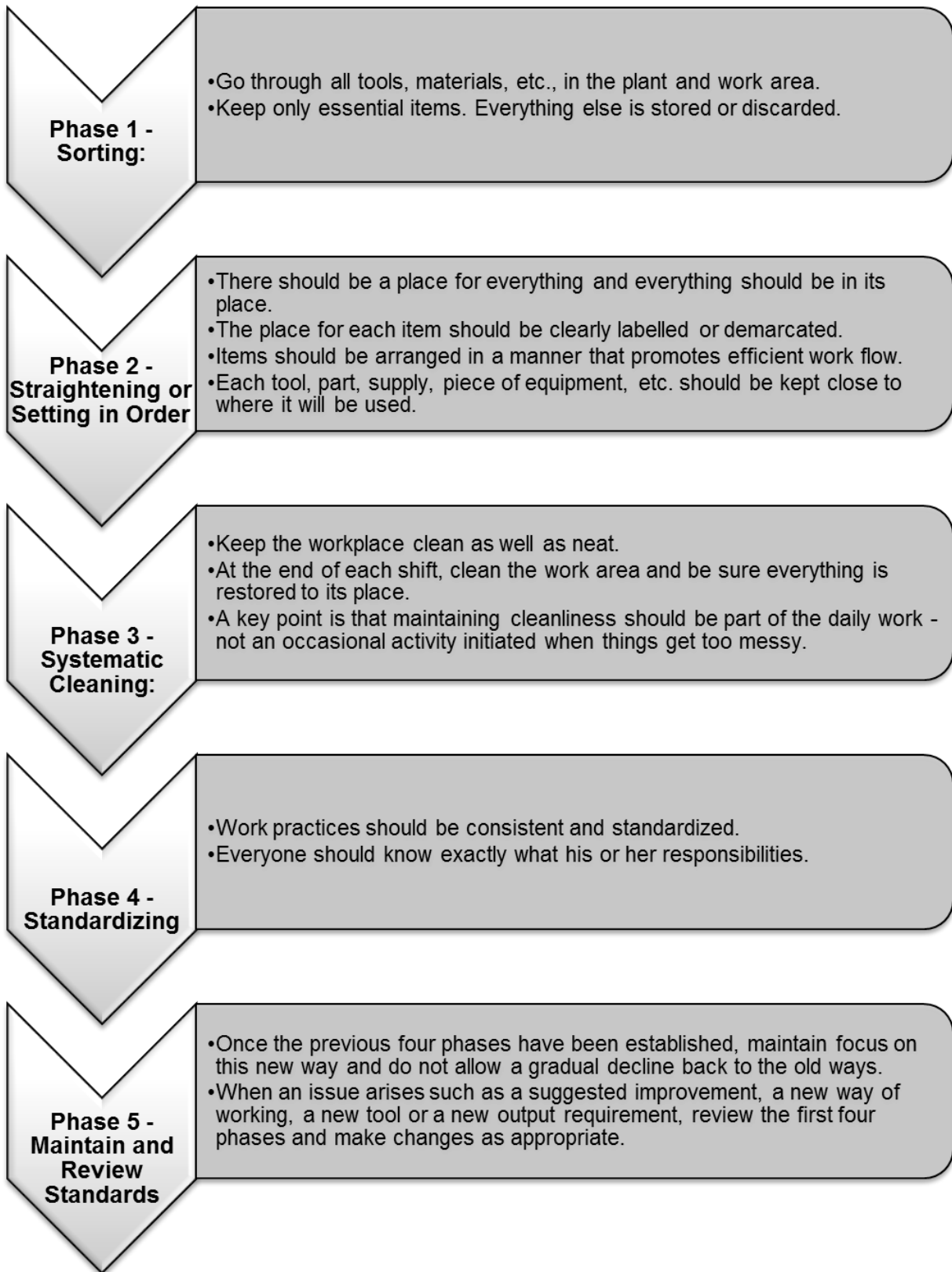
## Safety Checklist

It is every employee's responsibility to be on the lookout for possible hazards. If you spot one of the conditions on the following list—or any other possible hazardous situation—report it to your supervisor immediately.

- Slippery floors and walkways
- Tripping hazards, such as hose links, piping, etc.
- Missing (or inoperative) entrance and exit signs and lighting
- Poorly lighted stairs
- Loose handrails or guard rails
- Open, loose or broken windows
- Dangerously piled supplies or equipment
- Unlocked doors and gates
- Electrical equipment left operating
- Open doors on electrical panels
- Leaks of steam, water, oil, other liquids
- Blocked aisles
- Blocked fire extinguishers, hose sprinkler heads
- Blocked fire doors
- Evidence of any equipment running hot or overheating
- Oily rags
- Evidence of smoking in non-smoking areas
- Roof leaks
- Directional or warning signs not in place
- Safety devices not operating properly
- Machine, power transmission, or drive guards missing, damaged, loose, or improperly placed

## Maintenance and Cleanliness Of Workplace

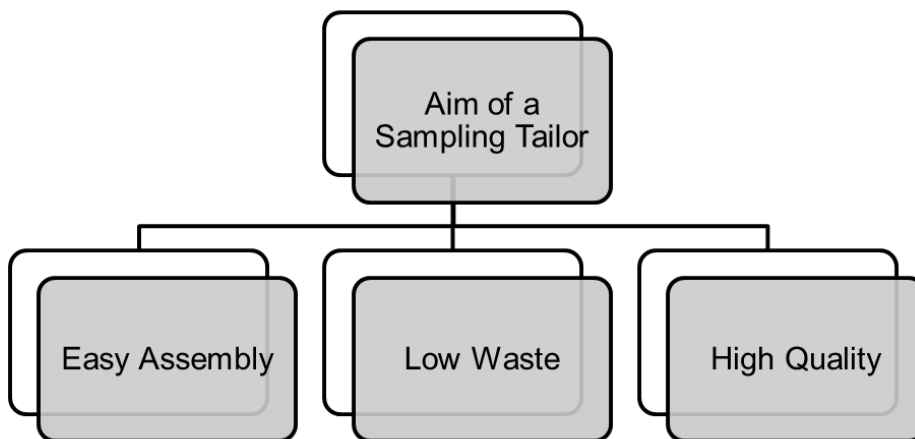
The list given below describes how items are stored and how the new order is maintained. The decision making process usually comes from a dialogue about standardization which builds a clear understanding among employees of how work should be done. It also instills ownership of the process in each employee.



## DEBRIEFING

- To maintain the work area you need better organized storage, resourceful transport, mechanical handling and efficient cleaning operations.
- Extra stock can become waste in absence of adequate storage space, provisions for record keeping and additional handling expenses.
- Avoid placing materials on the floor.
- Avail use of multi-level racks for storage.
- Providing storage for each tool and work items
- Tools should be kept within easy reach of the worker.
- Time and physical effort can be saved by using platforms so that goods do not have to be lifted during loading and unloading operations.
- To ensure your safety, and that of your co-workers, please observe and obey the rules and guidelines appropriate to the general populace or specific jobs:
- It is every employee’s responsibility to be on the lookout for possible hazards. If you spot any one such condition, report it to your supervisor immediately.
- Most used tools can be attached to the worktable, supplies can be stored in small bins or boxes above, or below the worktable, and small accessories can also be placed in small boxes or on special feeders.

### Fix Improvements in Design & Manufacturing



If you want to have a higher return from your products, each garment should be analysed with a view to reducing manufacturing costs, improving product quality and profit margins, and consistently achieving high quality. To gain new markets and higher returns, you will have to simplify assembly operations and work reduce waste.