

# **WEAVING AND KNITTING OPERATION**

## **Level-II**

**Based on March 2022, Curriculum Version 1**



**Module Title: - Perform warping operation**

**Module code: IND WKO2 M03 0322**

**Nominal duration: 48 Hours**

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## **Acronym**

OHS	<b>Occupational health and safety</b>
PPE	<b>Personal protective equipment</b>

## Introduction to the Module

In weaving and knitting field: Weaving is a method of textile production in which two or more distinct sets of yarns or threads are interlaced to form a fabric or cloth. While knitting is the production of fabric by employing a continuous yarn or set of yarns to form a series of interlocking loops.

Yarn preparation for weaving involves the process of preparing a double flanged beam of warp yarns and winding of warp ends from many winding of packages (cone or cheese) that arranged parallel to each other that improve the yarn's weave ability or knit ability.

This module is designed to meet the industry requirement under the **weaving and knitting operation, particularly** for the unit of competency: **perform warping operation.**

**This module covers the units:**

- Warp yarn preparation
- Warping Process
- Complete Warping Operations and record

### Learning Objective of the Module

- Set Up And Select Proper Yarn
- Perform Warping Process
- Complete Operations
- Complete Records

### Module Instruction

For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” given at the end of each unit and except unit three
5. Read the identified reference book for Examples and exercise

## Unit One: Warp Yarn Preparation

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

- Maintaining clean and safe work area
- Warp plan and select Correct yarn
- Loading Cones/chesses in to creel

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:

- Maintain Clean and safe work area
- Check and Correct warp plan yarn
- Load Cones/chesses onto creel.

## **1.1. Maintaining clean and safe work area**

### **Maintaining clean:**

After any work is performed, work area must be cleaned to its standards and get ready for the next activity. Poor floor conditions are a leading cause of incidents so cleaning up spilled oil and other liquids at once is important. Allowing dust to accumulate can also cause incidents. So regularly cleaning the floor can prevent their accumulation.

Areas that cannot be cleaned continuously, such as entrance ways, should have anti-slip flooring. Keeping floors in good order also means replacing any worn or damaged flooring that poses hazard.

Generally area cleaning can use the following equipment and tools. Brooms, detergents, glove, breathing musk, safety clothes and etc.

### **1.12 Safe work area:**

During warping operation OHSP practice is important. This OHS May include the following

- Comply with health and safety related instructions applicable to the workplace
- Use and maintain PPE such as ‘ear plug’, ‘nose mask’& ‘ head cap’ etc., as per protocol
- Maintain a healthy lifestyle and guard against dependency on intoxicants
- Follow environment management system related procedures
- Report any service malfunctions that cannot be rectified
- Store materials and equipment in line with organizational requirements
- Safely handle and remove waste
- Minimize health and safety risks to self and others due to own actions
- Seek clarifications, from supervisors or other authorized personnel in case of perceived risks
- Monitor the workplace and work processes for potential risks and threat
- Carry out periodic walk-through to keep work area free from hazards and obstructions, if assigned
- hazard identification and control, risk assessment and implementation of risk reduction
- standard operating procedures

- safe materials handling
- taking of rest breaks
- ergonomic arrangement of workplaces
- following marked walkways
- safe storage of equipment
- housekeeping
- reporting accidents and incidents
- environmental practices

## **1.2. Warp plan and select correct yarn**

### **1.2.1 warp plan and weft plan:**

These are the customer need orders whether warp or weft yarns are arranged.

#### **A. Warping plan**

- ✓ The warping plan is the order in which the warp threads are arranged. The smallest number of ends in colour and/or count that repeats across the fabric is the warp repeat.
- ✓ The warping order is given from left to right, standing at the front of the loom.

#### **Weft or picking plan**

- ✓ The weft or picking plan is the order the weft threads are inserted into the warp. The smallest number of picks in colour and/or count that repeats up the fabric is the weft repeat.
- ✓ The picking order is given from bottom to top, standing at the front of the loom

### **Select correct yarn:**

During performing creeling operations, production specifications are checked to identify requirements for yarn quantity, quality & color as per required. The description of the above listed production parameters is as follows

- **Yarn Quantity**

The yarn quantity shows the mass, length, count of yarn & the number of yarn required in the production specifications.

Example:

- The size of cones required in warping process



- The weight of ends required on weft magazine for looms
- **Count of Yarn**

Count of yarn shows the thinness or thickness of the given yarn. The count of yarn in each batch of cone or beam must be same.

- **Yarn Quality**

When load the creels, the quality of the yarn specified must be checked & translated.

Example:

- The strength of each yarn end must be same
- The evenness / uniformity of each yarn must be same
- Sufficiently and uniformly strong
- Uniform in cross-section
- Uniform warp tension
- Uniformly sized
- Less hairy and clean
- Minimum number of knot
- Proper or standard sizes and types of knots
- Free from neps slubs and loose fiber
- Parallel arrangement of warp yarn in the weavers Beam

### **Color of Yarn**

When colored yarn is used, check the position of each color on the creel must. Colored yarns used, especially in sectional warping machine, in manufacturing stripe knitted fabric& weft yarn magazine for loom.

### **1.3. Loading Cones/chesses in to creel**

The creels are simply metallic frames on which the feeding bobbins are fitted. They are outfitted with yarn tension devices, which in modern machines are provided with automatic control and centralized tension variation. The creels are the frames on which the cones, which feed the warped are, pinned. The number of cones depends on the type of fabric to be produced. The yarns are wound side by side and parallel one another on the beam, if possible with the same tension. The tension devices fitted on the creels are designed to obtain this uniform tension. The cone position and their accessibility are two important factors for the operator.

Creel is a platform, which holds the supply packages like cone, cheese or spool in warping process. Warping machine consists of several parts such as creel, open reed,

headstock, warping drum etc. Feeding bobbins, cones, cheese or spools are fitted on metallic frames called as creels.

Creel is used in warping, weft magazine for looms and knitting, holding roving frame packages for ring frame & accommodate beam in sizing machine and etc

### **Creeling in Warping Machine:**

- Creels are equipped with yarn tensioning devices, which in modern machines are provided with automatic control and centralized tension variation. Moreover the creels are equipped with yarn breakage monitoring systems
- The creel capacity is the parameter on which the number of warping sections or beams depends; it should be as high as the installation type and planning permit. Various solutions have been designed to reduce the time required to load the creel and thus increase the warping performance.
- Remove the run out cones/ cheeses of the previous program.
- Collect the removed cones/cheeses in trolleys/ bags provided.
- Pack the said collected cones/ cheeses as per the instructions given
- Write the following details on the packed bags
  - ✓ Count details
  - ✓ Mill Name
  - ✓ Warping Set No.
  - ✓ No. Of Cones
  - ✓ Gross wt. in kgs
  - ✓ Net Wt. in Kgs
- Clean the warping creel area & the warping machine thoroughly
- Bring the yarn bags required for the next program and keep the same at the centre of the warping creel
- Bring the empty trolleys provided to store empty polythene cone covers. cone inserts and keep the same at the centre of the warping creel
- Remove the polythene cone bags, cone inserts etc., & to store the same in the respective trolleys provided
- creel the cones/ cheeses in the creel stand

- Remove the trolleys wherein the e

### Component of warping creel and Their Functions:

All warping machines have the same parts, creels, and headstock and control devices

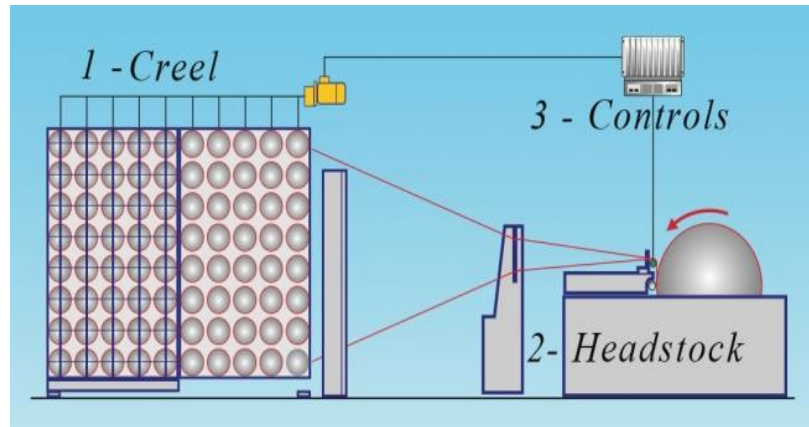


Figure 1.1: parts of creeling

1. **Creel** : To hold the cones of yarn or cheese packages
- **Yarncleaner**- it is used to remove different yarn faults like slubs, nepsand etc.
  - Stop device*- it is used to stop the machine when yarns are broken

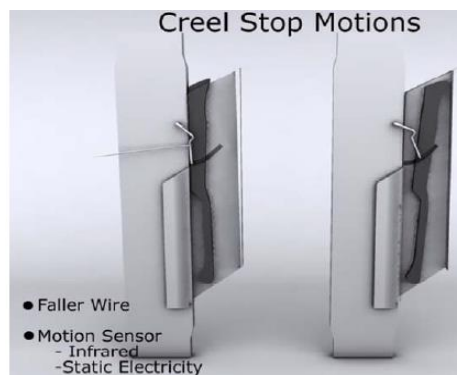


Figure.1.2:Creel Stops Motion by Faller Wires

- **The stop motion** is activated by faller wires which are kept pulled back ward when the end is intact. When the end breaks, the faller wire drops forward and makes contact to complete the electrical circuit to stop the warper

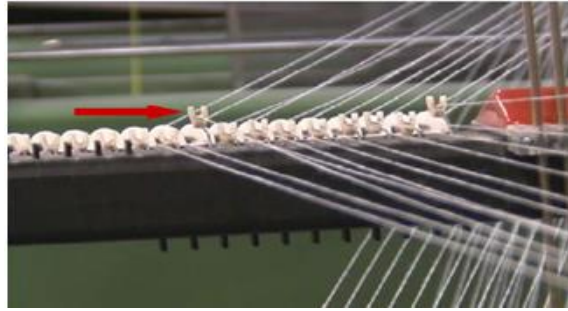


Figure.1.3: Stop Motions

- **The photo** shows a stop motion system mounted at the end of the creel. Each end is passed through a guide wire. Because of tension on the yarn, the wire is kept out of contact with the electrical circuit until an end breaks. When an end breaks, the tension is released allowing the wire to engage or contact with the electrical circuit and stopping the warper.
- **Indicator**-is used to indicate yarn breakage in the package.
- **Tensioner** - is used to keep the yarn in a uniform tension



Figure.1.4: Tensioner Device

- **Yarn guide**- it is used to pass the yarn in specific way.
- **Flanged bobbin or cone or cheese** - it is used to hold the yarn package.
- **Blower or suction fan**- it is used to remove dirt or dust from the yarn

### Types of Warping Creels:

They are the metallic frames, where the yarn cones are fitted / organized to be fed to the intermediate carrier. The creels are usually fitted with sensors for yarn tension and yarn breakage. The creel capacity is an indication of the number of the cone fitted on it, it is parameter that determines the number of section of beams. The capacity usually between 800 – 1200 cones. Different designs of creels are available to overcome the problems of consuming time and space

There are several types of creels available, which can be categorized as transfer type or non-transfer type. This is used depending upon the type of warper, size of supply packages and floor space available.

### A. Transfer Type of Creels

The transfer type creels have two packages tied together to run continuously from one package to the next.

#### 1. Magazine creel

The magazine creel holds two packages side by side which feed one end going to the beam. The transfer tail of the running package is tied to the reserve package. When the package running is depleted, the reserve package is brought into action keeping the supply of yarn continuous.

An advantage is continuous running and allows packages of different sizes to be run.

The disadvantages are knots in the yarn, a creel structure that takes up more floor space and the supply packages must have well-formed tails.

This type of creels are used when similar types of warps are needed to be prepared. Two cones are used, one operating and one as reserve

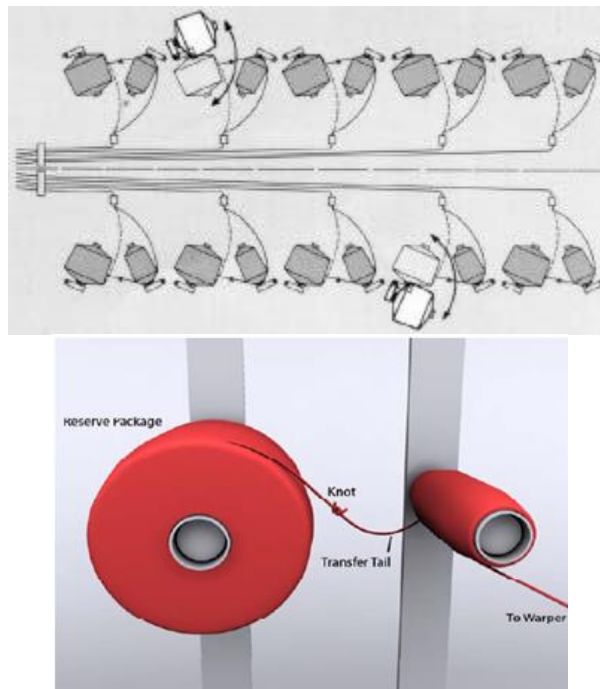


Figure.1.5: Magazine Creel

### B. Non-Transfer Type of Creels

The non-transfer types of creels have only one supply package for each end on the beam. This type uses metered packages to supply the yarns, which all run out at the same time. This includes swivel creel and mobile or truck creel, V-shaped Creeland etc.

### 1. SwivelCreel

The swivel creel is two sided. One side holds the packages that are being run and the other side is equipped with holders for full packages. The sections can be swiveled or rotated 180° to bring the reserve packages into a running position when the running packages are depleted.

This creel allows mounting of reserve packages without increasing floor space requirements

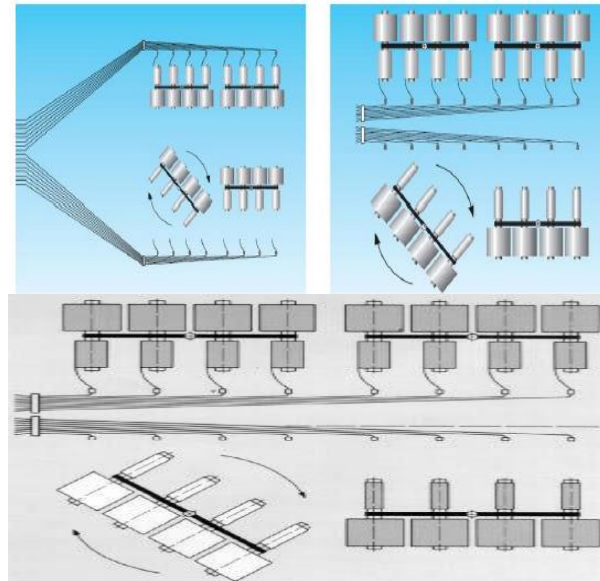


Figure.1.6: Swivel Creel

### 2. Truck or Mobile Creel

This creel is formed by trolleys that can be fitted in the creels, which save time and space.

This creel type is formed by trolleys or trucks, which can be taken individually out of the creel. Frames loaded with full packages are changed with empty package frames at run out. The truck sections can be rolled out to remove depleted supply packages so full packages can be rolled into position replacing depleted packages.

The truck sections can be creeled with a bobbins or cones in advance and be ready when needed outside of creel zone. This reduces considerably the waiting time. The mobile

creel comes in handy especially when there is insufficient room to permit the use of two standard creels



Figure 1.7: Mobile creel

### 3. V-shaped Creel:

In this creel, the cones are fitted on endless chain; one side of the chain is operating while the other can be fitted with cones. When the operating side finished the chain rotates to bring the other side to the front to be operated. This creel reduces the tension on the yarns and produces uniform tension across the beam.

The yarn lot can be changed by simply pushing a button, which starts the electrically drive of the chains. The empty bobbins move towards the inside of the creel, the full bobbins towards the outside

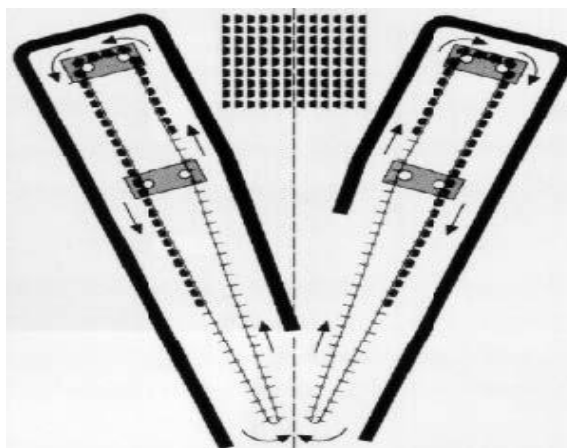


Figure 1.8: V-shaped creel



The yarns in cone form loaded on creel magazine, then yarns pass through yarn feeler (weft stop motion) & enter into yarn accumulators & clearing devices. Yarn accumulators store a certain length of yarn temporarily. Clearing devices remove yarn faults.

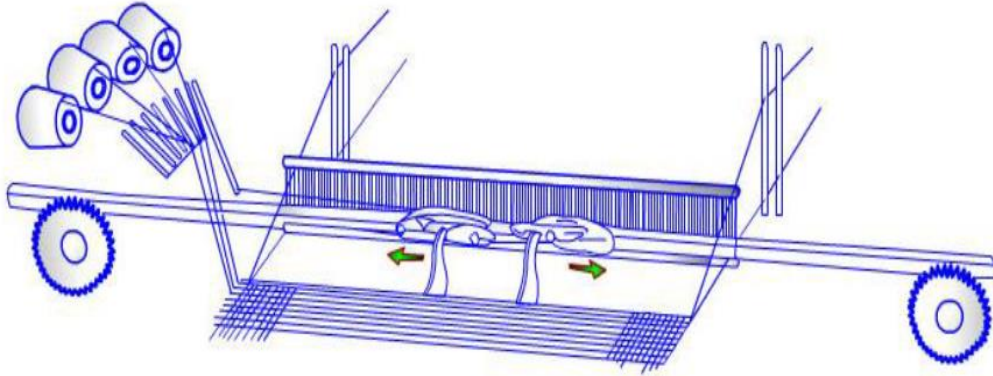


Figure.1.9:weft magazine Creel for loom

### **Clearing in Knitting Machine**

In knitting machine, the yarn package (cone or beam) loaded on creel magazine. Then the yarn passes through guiding devices, tensioning devices & stop motion devices. After that, the yarn accumulated temporarily on yarn accumulators & the yarn fed to the machine.



Figure.1.10: Creel of Circular Weft Knitting Machine





Figure.1.11: Creel of warp knitting machine

### Creeling in Sizing Machine

Warpers beam are loaded on to the creel & there is uniformity of tension throughout the ends on the weavers beam. The tension of warp sheets can be maintained constant by the braking mechanism of the creel.

$$F_b = \frac{T \cdot r}{R}$$

Where, T – Warp

R – Diameter of hub

r - Diameter of a beam

F<sub>b</sub> – Brake force

### 2. Headstock

The winding process requires extra attention to tension of the yarns and the headstock is equipped with precision direct drive, advanced electronics, smooth doffing and programmable breaks. Also measuring roller connected to control devices.

In the sectional warping, the headstock consists of the drum, trolley, warping carriage, leasing device and beam carrying chuck, **figure 1.12** . 1 is the drum, 2 the leasing device that splits the layers of the yarns to separate them for later processes, 3 is carriage bearing, a is the expandable comb that control the section width and position the section on the drum, b is the guide and metering roller, which measure the tension on the and give the feedback to the pressure control on the creel and c is the leveling roller to carry out winding at low tension and have a compact winding. the carriage

feed the yarns to the drum in the conical shape with its traverse motion. The carriage also move with every new section, the creel has to move to keep the threads perpendicular to the drum.

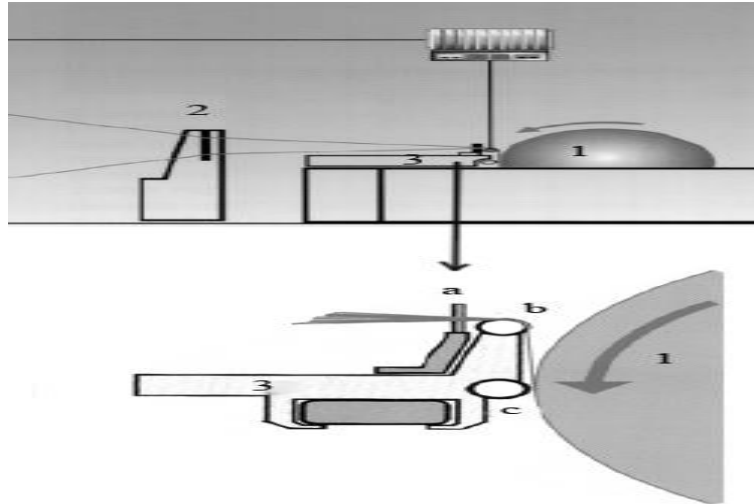


Figure 1.12: The head in the sectional warping machine

The headstock for the direct warping is simpler than the previous one, **figure 1.13**; It consists of expanding comb, pressure roll and beam. The expanding comb is a zigzag comb place the yarns at the required width and order. The pressure roll works to ensure a cylindrical beam. The beam, **figure 1.14**, is where the yarns are wound onto.

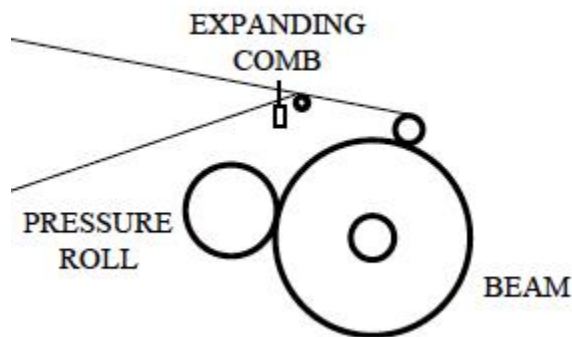


Figure 1.13: The head on the direct warping machine



Figure 1.14: Beams

### 3. Controls

As mentioned earlier the tension should be applied equally and fully controlled during the warping process. The control devices are to ensure this. Beside the controls the exist on the headstocks, the creel has a control over the tension for single yarns, **figure 1.15**. The disc tensioner apply tension on the yarns, the new tensions can be controlled separately by mean of aerodynamic and connected to the main machine computer.

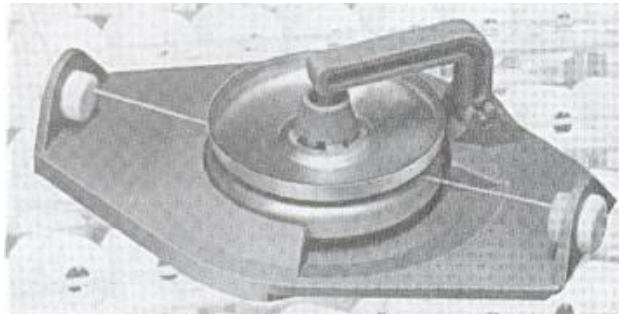


Figure 1.15: Yarn disc tensioner

In addition, the yarn break sensors, **figure 1.16**, to stop the machine when there is a yarn break.



**Figure 1.16: Yarn break sensors**

## Self-Check - 1

### Choose the Correct Answer

1. In which of the following textile machinery creeling system used?
  - A. Warping machine
  - B. sizing machine
  - C. Modern carding machine
  - D. A&B E. A&C
2. Which of the following is not part of creel?
  - A. Tensioner
  - B. Stop device
  - C. Guide device
  - D. Drying device
3. Among the following, which one is product specification while performing creeling operations?
  - A. Quantity of yarn
  - B. colour of yarn
  - C. Quality of yarn
  - D. All
4. What is the use of creel?
  - A. Accommodate yarn packages
  - B. Convert yarn to fabric
  - C. Sometimes used as spinning machines
  - D. All
5. What is the use of tensioner in creeling systems?
  - A. To keep the yarn in uniform tension
  - B. It helps us to get packed yarn
  - C. It helps the yarn to pass in a specific way
  - D. A&B
  - E. B&C

## PART II

Match column “A” With column “B” & write the best answer of capital letter on the space provided

### AB

- |                                             |                   |
|---------------------------------------------|-------------------|
| 1. Types of warping creel                   | A. Tensioner      |
| 2. Used to keep the yarn in uniform tension | B. weaver’s knot  |
| 3. Methods of yarn repairing                | C. magazine creel |
| 4. Body language                            | D. warp yarn      |
| 5. Used for weaving                         | E. Nodding head   |

## PART III

### Short Answer questions

1. What is warping of beam? Explain
2. Write down types of creel in warping process?
3. Write the components of creel? And explain each?
4. Write the concept of creeling ?
5. What is creel?

## Operation Sheet 1

### Operation Title

### Operation of Creeling cone yarn on the creel

### Purpose

To perform creeling operations accurately

### Instruction

Using 100 of warp cone or cheese and given equipments used for creeling. You have given 1:30 hrs for the task and you are expected to write the answer on the given line



### Equipment, Tools & materials

Creels with a full of accessories & Yarn packages with standard quality

### Conditions or situations for the operations

The operation is take place in Standard temperature & relative humidity

### Procedure

1. Select raw materials with acceptable quality
1. Adjust the creels according to product specifications
2. Load creels with yarn packages
3. Start the operation according to manufacturer specification
4. Monitor the operation throughout the process to meet product specification
5. Stop the operation according to manufacturer specification & clean area around the machine
6. Check the quality end product upon standard

### Precautions

The trainees must check the quality of the operation

### Quality criteria

The end product exactly meet preset specification

## Lap Test 1

Name \_\_\_\_\_ Date \_\_\_\_\_

Time Started \_\_\_\_\_ Time Finished \_\_\_\_\_

### Instructions

1. Set, load & operate creels according to product specifications.
2. Request your instructor for evaluation & feed back.



## Unit Two: warping process

This unit to provide you the necessary information regarding the following content coverage and topics:

- Set up warping machine
- warping process
- beaming process
- Maintaining yarn flow
- Checkupfinal beam package.

Checking final beam package This guide 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:

- Ensure warping machine setting adjustment
- Carry out warping process to meet specification
- Carry out beaming process to meet specifications
- Maintain yarn flow according to the need and speed of the machine and OHS practices.
- Check Product against standards.

## 2.1 Set up warping machine

Setting of the warping machine adjustment include the following:

- cone alignment
- checking of thread guides
- tension adjustment
- Checking pressure between pressure drum & warping beam
- Adjust the combs
- Set warping machine speed based on material
- Set the warp length

## 2.2 Warping process

We know that woven fabric is made by two sets of yarn; warp and weft. Warp yarns run with along the length of fabric and weft yarns go across the width of the fabric.

Warping is the preparation of yarn to weave fabric. It is the transfer of many yarns from the creel of single packages to a beam. The yarns will form a parallel sheet of yarn wound onto the beam. The basic objective of warping is to build a package where yarn ends remain in uniformly set parallel & continuous form & there by to accelerate the next process either sizing or drawing-in.

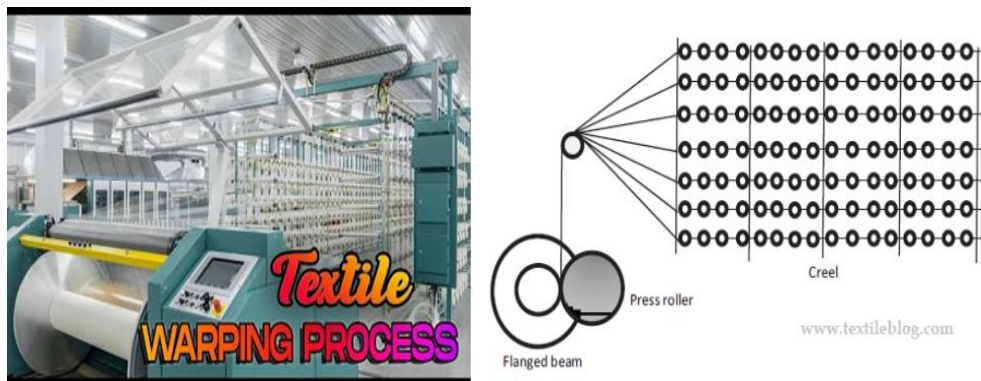


Figure 2.1: Warping machine

### Objective of warping

- The main objective of warping is to prepare a warp sheet of desired length containing a desired number of yarns that are wrapped on a flanged barrel in such a manner that tension in each yarn and density of yarn mass in the cylindrical

assembly are maintained within a given tolerance level throughout the wrapping of the warp beam.

- By warping process yarn quality increase, wound up fixed length of yarn on weavers beam. Increase the weave ability of yarn. In this process small packages can re-use. After all increase the production.
- The process of warping is dedicated to the conversion of cones into a beam of given specifications.
- is to convert a predetermined number of single end packages, such as cones or cheeses into a sheet of yarn of specified length & width.
- The individual's ends in the warp are uniformly spaced across its full width

### **Requirement of warping**

- Warping predetermined length should be observed
- Wounded ends tension must be uniform
- Wounded ends beam density must be uniform
- Warping package surface must be cylindrical
- Warping production rate should be high
- During warping yarn should not be damaged

### **Types of warping**

There are two types of warping are popular in textile industry for preparing warp yarn for power driven high speed looms or hand looms High speed warping machine is used for producing weavers beam from the single yarn.

These are: Direct Warping or Beam warping. Sectional Warping

#### **A. Direct warping or Beam warping**

In this system the yarns are withdrawn from the single-end yarn packages on the creel and directly wound on a beam. Direct warping is used in two ways.

Directly producing the weaver's beam in a single operation. This is especially suitable for strong yarns that do not require sizing, example for continuous filament yarns. This process is called direct beaming

This warping is done on two separate stages, first to wind the yarns onto beams, then unwind these beams and wind the yarns on the weavers beam as described below. The speed in this type is 1200 m/min.

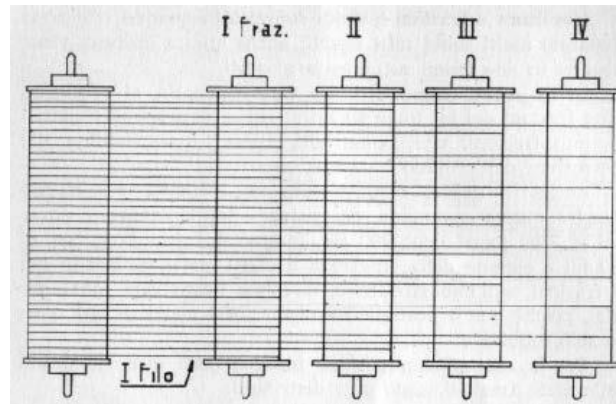


Figure 2.2: Beaming

$$\text{Beam number} = \frac{\text{Total number of warp threads}}{\text{Creel loading capacity}}$$

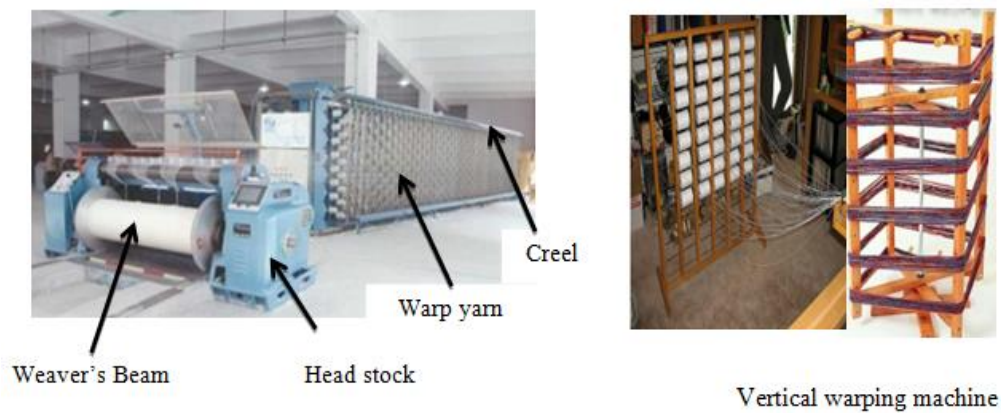


Figure2.3: Direct warping

To make smaller, intermediate beams called warper's beams which are combined later at the slashing stage to produce the weaver's beam. This process is called beaming

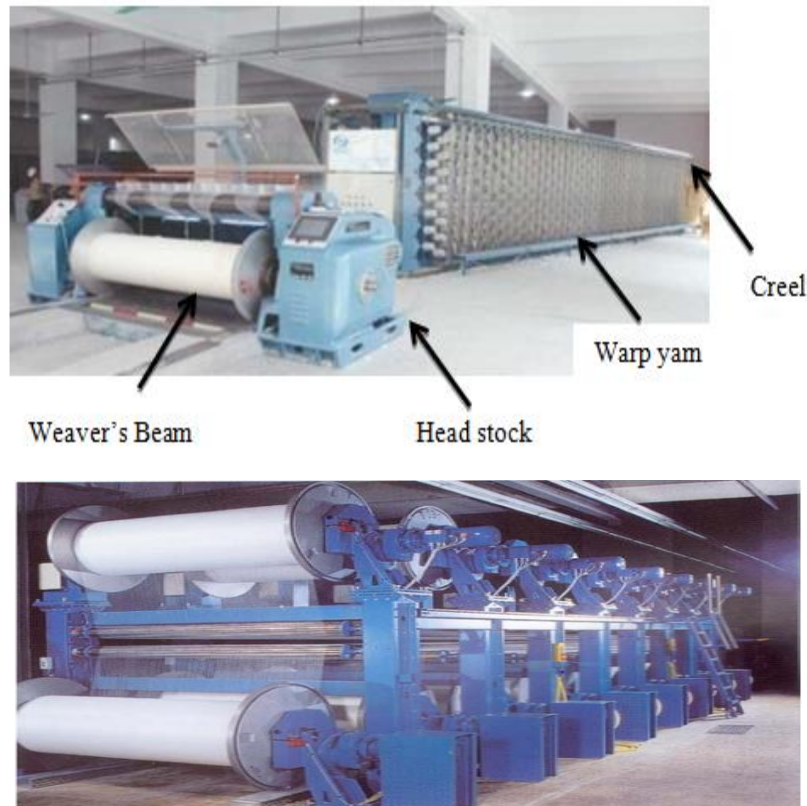


Figure 2.4: Intermediate Warper's Beams

### B. Indirect warping or Sectional Warping

The other names of this system are section warping or pattern warping, band warping or drum warping. The section beam is tapered at one end. Warp yarn is wound on the beam in sections starting with the tapered end of the beam. Each section has multiple ends traversed together slowly during winding along the length of the section.

It is important that each layer on the beam contain the same number of yarns. The same length of yarn is wound on each section which is measured by a measuring roller.

The amount of yarn wound on the beam is proportional to the length of each section and the conical angle ( $\alpha$ ).

The drum of the beam has a cone which has a slight angle that will prevent the yarns from slipping off. Sectional warping is important if for making a yarn dyed striped towel. The conical shape dresser or drum is the mark of this type of warping. See figure 5. below.

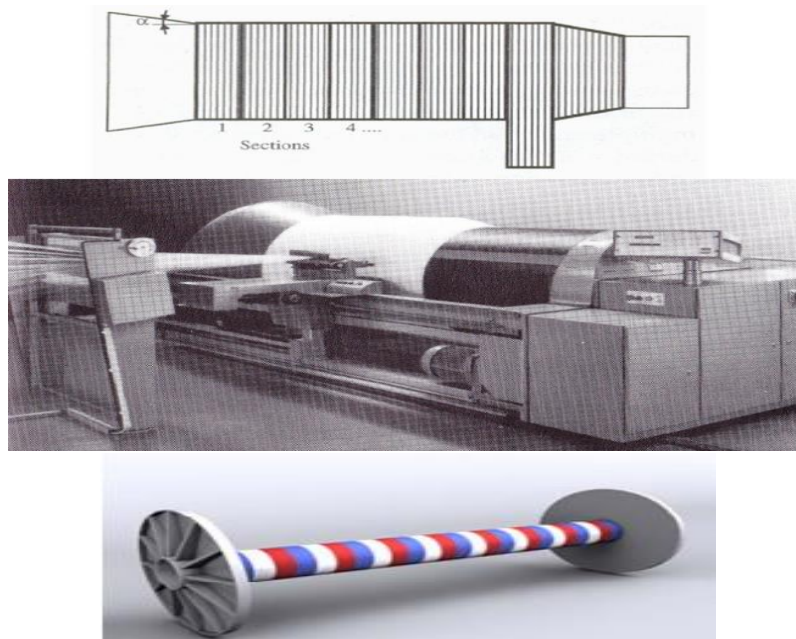


Figure 2.5: sectional warping

Exact uniform height on the warping drum is achieved by using a feeler roller. As soon as the warping starts, the roller starts measuring the buildup of the yarn with an electronic sensor. The measured data is fed to a computer that calculates the exact traverse per revolution.

This system is used for patterned fabrics. Ends are first wound onto a drum tapered with a given cone angle then these warp threads transferred onto a weaver's beam by unwinding the drum. In this system warp threads are not processed in sizing

$$\text{Section number} = \frac{\text{Total number of warp threads}}{\text{Creel loading capacity}}$$

If this equation did not produce a correct number then the number of sections is adjusted to a bigger corrected one with a change in the total number of the yarns being warped.

$$\text{Section width} = \frac{\text{Reed width}}{\text{Number of section}}$$



As soon as all the section are being wound, on the dresser, the second phase to produce the weaver's beam starts. The sections are unwound from the drum to the beam at the same time, this process is called beaming.

### **C, Ball Warping**

This is mainly used in manufacturing of denim fabrics. The warp yarns are wound on a ball beam in the form of a tow for indigo dyeing. After the dyeing process, the tow is separated and wound on a beam. This is known as re-beaming.

Generally warping machine has three major components: creel, headstock and control devices

### **Warping Calculation**

#### **Yarn Calculation Requirement**

- The finished length of cloth plus (hems (2inch), take up and shrinkage (10-15%) and loom waste (36inch or 1yard).
- The width of the warp in the reed (width of material wanted plus shrinkage, Add 10% – 15% for shrinkage.). E.g. take 10% shrinkage.
- The sett of the warp (how many ends per cm or inch of yarn we need)

#### **Given formulas:**

$$Nr = \frac{p_o(1 - \% \text{ weft crimp})}{(\text{ends /dent})}$$

Key:-

$P_o$  = warp density (EPI)

Nr = Reed count

#Q1. Given the following data

- Fabric width = 24inch,
- Warp density (EPI) =40
- Weft crimp=10%
- Ends/dent =2
- General Selvedge width (1-2.5cm) =1cm(0.393inch)
- Finished Project length = 36inch

#### **Required:**

A. Nr(reed count)

B. Total number of ends in the ground

- C. Total number of ends in the selvedge
- D. Total number of ends in the ground and selvedge
- E. Total dent
- F. Total length of one yarn
- G. Total project width

Solution:

A. Nr reed count

$$= p_o (1 - \% \text{ shrinkage}) / \text{ends /dent}$$

$$= 40(1 - 0.1) / 2 = \underline{\underline{18}}$$

B. Total project width

$$= \text{Project width} + \% \text{ shrinkage of project width}$$

$$= 24\text{inch} + 24\text{inch} * 0.1$$

$$= 24\text{inch} + 2.4\text{inch}$$

$$\text{Total width} = 24 + 2.4 = \underline{\underline{26.4\text{inch}}}$$

C. Total number of ends in the ground

$$1\text{inch} = 40\text{end}$$

$$26.4\text{inch} = ?$$

$$26.4\text{inch} * 40\text{end} / 1\text{inch} = \underline{\underline{1056\text{ends}}}$$

C. Total number of ends in the selvedge

$$1\text{inch} = 40\text{end}$$

$$0.393\text{inch} = ?$$

$$0.393\text{inch} * 40\text{end} / 1\text{inch} = 15.74 \approx 16\text{ends in one selvedge side, } 16 * 2 \text{ for both side}$$

D. Total number of ends in the ground and selvedge

$$= (\text{Total number of ends in the ground}) + (\text{Total number of ends in the selvedge})$$

$$= 1056 + 32$$

$$= \underline{\underline{1088\text{ ends}}}$$

E. Total dent

$$= \text{total number of warp ends in the ground} / 2$$

$$= 1056 / 2$$

$$= \underline{\underline{528\text{ dents}}}$$

F. Total length of one yarn



= project length + loom wastage + %shrinkage + hems \*2

= 36inch + 1yard + 36inch \*10% + 2inch \*2

= 36inch + 36inch +3.6inch + 4inch

**Total length of one yarn** = 79.6inch = **80inch**, butfor all yarns,

It will be 79.6inch \* 1088= **86604.8inch**

### **2.3. Performing beaming process**

Beaming comprises winding the full width of the warp yarns in a single winding operation on the weaving beam (i.e. the beam which is to be placed on the loom). The warp yarns can be wound from a creel or a warping beam. Leasing comprises inserting lease cords between the warp yarns to separate groups of warp yarns

The warp beam, which holds the lengthwise yarns, is located at the back of the machine and is controlled so that it releases yarns to the weaving area of the loom as needed

Warping is the process of combining yarns from different cones together to form a sheet. The important point in the warping is to preserve the yarn elongation and maintain it at uniform level. This is done to achieve a better performance during weaving in terms of low end breakage rate.

### **2.4Maintaining yarn flow**

Adjust the tension of yarn to meet production requirements. The adjustment of tension is to maintain the continuous flow of yarn. If the tension is very high, the yarn may break and if the tension is very low, the yarn may slack. So, to maintain the continuous flow of yarn, tension of yarn must be moderate.

The sensors also checked to know properly working of the sensors. If the sensors are not properly work, the flush light is not actuated& it is difficult to identify the position of broken yarn (ends). So, to maintain the continuous flow of yarn, the sensors must work properly.

Yarn flow is maintained according to the speed of machine & OHS (occupational health & safety) practices. To achieve continuous flow of yarn, creels are reloaded with cones as required

### Draw-warping:

A process in which a number of thread lines, usually 800 to 2000 ends are oriented under essentially equal mechanical & thermal conditions by a stretching stage using variable speed rolls, then directly wound onto the beam. Draw warping process gives uniform end-to-end properties.

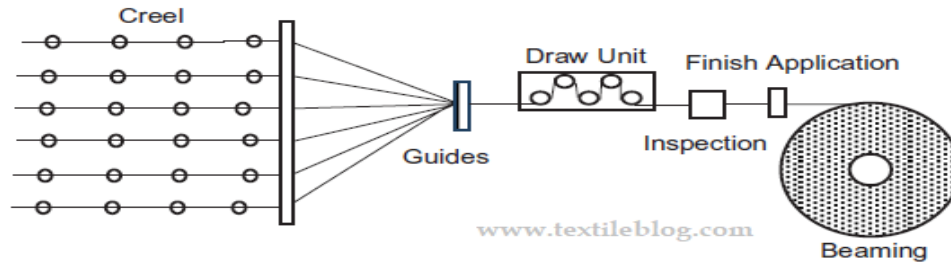
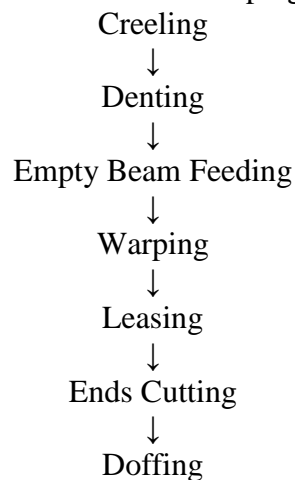


Figure 2.6: Draw warping process

The flow chart of warping is given bellow:

Flow Chart For Warping:



## 2.5 Checkup final beam package

### Requirements after warping process of warp

Following is the list of requirements out of a warped beam which are likely to affect later on processes especially sizing and weaving

- It is important that all threads are to be wound with equal tension. The tension should be maintained at a uniform level throughout the length and across the width of the warp sheet.

- The surface of the warp on the beam should be cylindrical, uniform and smooth with no ridges or sunken part.
- The threads near flanges are likely to sink inside the layers. The warp threads near flanges should not be caught in to the layers.
- Many times it is observed that the selvedge threads are wound at a lesser tension and are loose. One has to make sure that these threads are wound at the same tension as that of the rest of the threads.
- The hardness of the beam should be same throughout the width.
- There should not be any marks of higher pressure value throughout the length of the yarn on beam.
- The edges of the flanges are to be smoothly finished and should not cause any abrasion on the yarn during winding and unwinding. Also flanges should have clean surface and should not soil the yarn.
- Cleanliness of the machine including the Creel.
- Cleaning to be done with compressed air at every creel change.
- Check the alignment of packages mounted on the creel.
- Check whether the tension disc are used for right weight according to count of the yarn.
- Check that damaged beam should not used unless repaired.

**The following points should be noted to improve the quality of warping beams:**

- Condition of beam flanges: If the beam flanges are damaged, the unwinding of yarn near the flanges will not be satisfactory. This will cause difficulties in sizing and weaving.
- Stop Motions and Breaks: Proper stopping of the warping machine after an end break ensures that the broken end on the beam can be traced easily.
- Condition of the driving drum: On most warping machines the beam is driven by frictional contact with the driving drum. In order to get a package of the correct density, the pressure between the drum and the warper's beam has to be kept at fairly high level.

- **Barrel Diameter of the Beam:** Beams of small barrel diameter give rise to high unwinding tension at sizing, particularly when the beam is about to become empty.
- **Cuts in Accessories in the path of yarn:** Drop pins of stop motion, guide rollers, reed denting etc. should not have any grooves.
- **Creel Fans:** Fluff accumulated on the machine, particularly at thread guides, causes tension variations in the yarn. This fluff can pass on to the beam.
- **Length Measuring Motion:** The length measuring motion should be accurate, otherwise estimation of beam count would be wrong and subsequently will give incorrect values of size percent which is commonly determined from the weights of yarns on the warper's and the size beams.
- **Density of the Beam:** The beam should be firm, inadequate pressure between the beam and the drum causes soft beam. Adequate pressure should be maintained by making suitable mechanical adjustments.

## Self-check-2

### Part I

**Choose the best answer from the following alternative**

1. Which one of the following is the process of combining yarns from different cones together to form a sheet?
  - A. Winding
  - B. Warping
  - C. Weaving
  - D. A&B
2. One is the importance of warp
  - A. Construction of beam warp yarn
  - B. Construction of a parallel yarn sheet
  - C. Winding the predetermined length of yarn
  - D. Combination of small package
  - E. All
3. What are the components of warping machine?
  - A. Creel
  - B. Winding Drum
  - C. Beaming Unit.
  - D. All
4. One is the requirements of warping
  - A. Warping predetermined length should be observed.
  - B. Wounded ends tension must be uniform
  - C. Wounded ends beam density must be uniform.
  - D. Warping package surface must be cylindrical.
  - E. All Are Requirements
5. What are the two types of warping process used in woven fabric production.?
  - A. Pattern Warping
  - B. Sectional Warping,
  - C. Beam Warping
  - D. High Speed Warping.

E. All Of The Above

## Part II:

### Short Answer writing

**Instruction:** write short answer for the given question. You are provided 3 minute for each question and each point has 5Points.

1. Write down the requirement of warping?
2. Which type of warping method makes pattern design?
3. What are warping process?
4. Write down at least two objective of warping?
5. What is the difference direct warping and indirect warping?

## Part III: Matching

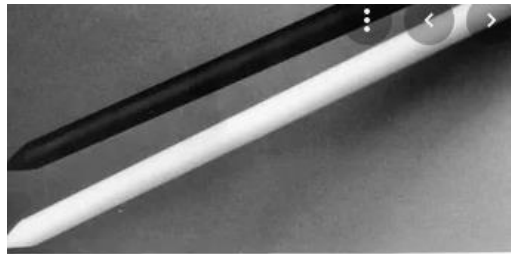
A	B
1 type of creel	A Ball warping
2 component of creel	B Magazine creel
3 Direct warping	C Sectional Warping
4 Indirect warping	D Yarn cleaner
5 used in manufacturing of denim fabrics	E V shape creel
	F Beam warping

## Operation sheet 2.1

**Operation Title** Perform warping process

**Purpose** To carry out or acquire required ends of warp

**Instruction** Using 10 equal length of warp cone or cheese and given equipment's used for warping. You have given 1:30 hrs for the task and you are expected to write the answer on the given line



**Equipment, Tools & materials** Warping machine with a full of accessories & 10 cone of high quality warp, Lease rod Scissors

**Conditions or situations for the operations** The operation is take place in Standard temperature & relative humidity

**Procedure**

1. The first operation of warping is crealing; i.e. to feed the empty cones in the creel..
2. Then the yarn ends passes through the dents of the comb of the reed.
3. Then the yarns from the cones are wrapped on to an empty beam.
4. As the warp beam wraps a predetermined amount of yarn; a lease

yarn is inserted that helps to separate each yarn from each other during sizing.

5. Finally the full beam is doffed out from the m/c.

**Precautions** The trainees and trainers must check the quality of the operation

**Quality criteria** end product exactly meet preset specification or winding warp must an acquiring required ends



### **Lap Test**

**Name**\_\_\_\_\_ **Date**\_\_\_\_\_

**Time Started**\_\_\_\_\_ **Time Finished**\_\_\_\_\_

1. Set, load & operate warping machine according to product specifications.
2. Request your instructor for evaluation & feed buck.

### **Unit Three: Completion of operations and complete records**

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

- Dispatching and doffing warp beam
- Forwarding wrapper beam to sizing
- Preparing reports
- Maintaining records

This guide 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 and move Empty cones and remnants to rewinding section.
- Forwardedwarpers beam to sizing section for loading
- Forward finished section warp/tape (weaver's beam) to storage or loom for loading
- Prepare reports based on the works done
- Maintain records as per the requirement for future reference and use

### **3.1 Dispatching and doffing warp beam**

#### **A. Unloading or doffing warp yarn product**

After the completion of the warping beam, as per the set mtrs, the warped beams have to be doffed.

Unloading is the activity performed after warping is completed. During this activity, the warping samples get-rid off or removed from the specific warping machine. The warper beam packages can be unloaded from warping machines in different forms. For example either in ball forms, beam form, or sectional form. Immediately after the doffing of the warped beams , the following details have to be written on the warped beams using chalk.

- Count
- Warp Set No.
- Warp Beam No.
- No. Of Ends
- Beam Mtrs

Generally, during unloading any warpedbeam samples, care must be taken.

#### **B. Dispatching warp beam product**

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 manpower and machinery.

**In a Decentralized dispatching system:**

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

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

A decentralized dispatching system has the following advantages.

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

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

### **3.2 Forwarding wrapper beam to sizing**

The primary purpose of the sizing process is to obtain the warp yarns, most likely to be woven without major damages during the passage of yarn through the process.

As the warp beam wraps a predetermined amount of yarn; a lease yarn is inserted that helps to separate each yarn from each other during sizing.

The required length of the yarn which is wound onto wrap beam depends on the length of the yarn on the weaving beam. During the sizing process, weaving beams

### **3.3 Preparing reports**

As its name implies, a completion report is written when a project has come to an end. The objectives, plan of work, and other items laid out in the proposal have been completed, and the final task is to write up the results of the project.

A description of the process by which the project was approved, and the business case for undertaking the project.

A summary of the project execution, including whether the project met its objectives or not.

#### **Progress of report**

One of the most important project reports you'll generate over the course of executing a project is the progress report. It is a report that updates the information about your project, specifically if it's meeting the baseline set by the schedule and budget

#### **In the project completion report**

- A review of the project story
- what happened,

- what was learned
- what went well and didn't go well, and
- measurements of the process and the product must reported

### **What is report-writing process?**

- Preparing to write.
- organizing the information;
- writing draft copy;
- Editing the information; and revising the text.

### **How to write a work report**

- Identify your audience.
- Decide which information you will include.
- Structure your report.
- Use concise and professional language.
- Proofread and edit your report.

### **3.4 Maintaining records**

After all warping activities are carried out; the operators need to record/write down all warping output including amount of warped beam and any problems encountered in work place area. And the recorded data are kept for file in the future

Accurately, record production & other documentations. Production records are the amount of product produced in a given time. Other documentations includes: Records of faults & risks in a given time etc

Documentation is a set of documents provided on paper or online, or on digital or analog media, such as audio tape or CDs.

### **Procedure and techniques of documentation:**

It is vary from sector to sector. In general these may involve documenting drafting, formatting, submitting, reviewing, approving, distributing, reposting and tracking, etc. it could also involve creating content from scratch. Documentation should be easy to read and understand.

### **How do you record project progress?**

Here are just a few effective ways of tracking project progress as a project manager.

- Create a Project Outline. Working with team members to create a project outline can be a great way of tracking project progress.
- Establish Goals and Milestones.
- Check in Regularly.
- Ask How You Can Help.
- Establish Clear Deadlines.

## Self-check-3

### Part I

Choose the best answer from the following alternative

1. the activity performed after warping is completed known as
  - A. Unloading
  - B. Doffing
  - C. Dispatching
  - D. A&B
  - E. B&C
2. The physical handing of a manufacturing order to the operating facility (a worker) or the release of orders
  - A. Unloading
  - B. Doffing
  - C. Dispatching
  - D. A&B
  - E. B&C
3. One of the following written when a project has come to an end
  - A. Report
  - B. Record
  - C. Documentation
  - D. Completion
  - E. A&B
4. \_\_\_\_\_ are the amount of product produced in a given time.
  - A. Production record
  - B. Production report
  - C. Documentation
  - D. Completion
  - E. None
5. One of the following is 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. .All production records should be properly maintained
- E. All of the above

## Part II

### Short Answer writing

Instruction: write short answer for the given question. You are provided 3 minute for each question and each point has 5PointS

1. What is Centralized dispatch system? Explain
2. What is decentralized dispatch system? Explain
3. Write the Procedure and techniques of documentation during recording.
4. What is report writing process?
5. Immediately after the doffing of the warped beams , what have been written on the warped beams using ?

## Part III Matching

A	B
1 Loading	A Warp count
2 Unloading	B Record project progress
3 Information written on the complete pr.	C dispatching
4 Create a Project Outline	D By identify audience
5 How to write report	E creeling
	F doffing

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