BASIC TEXTILE OPERATION

NTQF Level -I-

Learning Guide -57

Unit of Competence: Operating knitting machine

Module Title: Operating knitting machine

LG Code: **IND BTO1 M15 LO3-LG-57**

TTLM Code: **IND BTO1 M15 TTLM 09 19v1**

LO3: Operate and monitor knitting Machine

Instruction Sheet	1. Learning Guide #-57

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

- Rechecking the loaded yarn to ensure meets requirement
- Following and recoding counter read and data results as work requirements**.**
- Making necessary adjustments in accordance with the instructions
- Monitoring machine starting according to the instructions
- Checking proper yarn feeding system according to work specifications.
- Checking and replacing yarn supply to a continuous flow of machine.
- Sorting wastes and defects according to quality standard.
- Identifying minor product process and machine faults
- Reporting major machine faults

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to**:**

- Recheck the loaded yarn to ensure meets requirement
- Follow and recoding counter read and data results as work requirements**.**
- Make necessary adjustments in accordance with the instructions
- Monitor machine starting according to the instructions
- Check proper yarn feeding system according to work specifications.
- Check and replace yarn supply to a continuous flow of machine.
- Sort wastes and defects according to quality standard.
- Identify minor product process and machine faults
- Report major machine faults

Learning Instructions:

1. Read the specific objectives of this Learning Guide **-57-**
2. Follow the instructions described in number on page **–2-**
3. Read the information written in the “Information Sheets 1”, sheet 2, Sheet 3, sheet 4. sheet 5, sheet 6, sheet 7, Sheet 8 and sheet 9 on page 3, 8, 12, 23,28, 34, 39, 44,and 53 respectively
4. Accomplish the “Self-check 1”**,** Self –check 2, Self –check 3, Self- check 4, Self- check 5, Self- check 6**,** Self- check 7**,** Self- check 8 **and** Self- check 9 **on page 6, 10, 21, 27, 30, 37, 42, 51, and 62** respectively
5. Ask from your **trainer’s** the key to correction (key answers) or you can request your **trainer’s** to correct your work.
6. If you earned a satisfactory evaluation proceed to **“Information Sheet**”. However, if your rating is unsatisfactory, see your **trainer’s** for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Recheck the loaded yarn to ensure meets requirement

1.1. Introduction

The yarn is changed before or after the style is changed, it is important to handle the yarn packages in such a manner to ensure that proper yarn quality and package integrity has been maintained. More information on yarns for knitting can be found in cotton incorporated's yarn requirements for knitting. The package of yarn should be handled in such a manner that will not disturb the layers of yarn on the package. The yarn package transfer tail should not be unwound and allowed to hang loose under the package unless the machine is to double creeled, If double creeld, a reserve package is tied to the actively knitting package. The leading end of the reserve package is tied to the trailing end of the active package. It is important to consider the characteristics of the tail of the package. It is important to consider both the length of the tail and whether the tail is put inside the package. Wrapped around the base of the package, or wrapped around the yarn post in the creel. The length of the transfer tail on the package should be between six and eight inches. If the yarn is tied reserve package, a weaver's knot is preferred, because of its strength and small size.

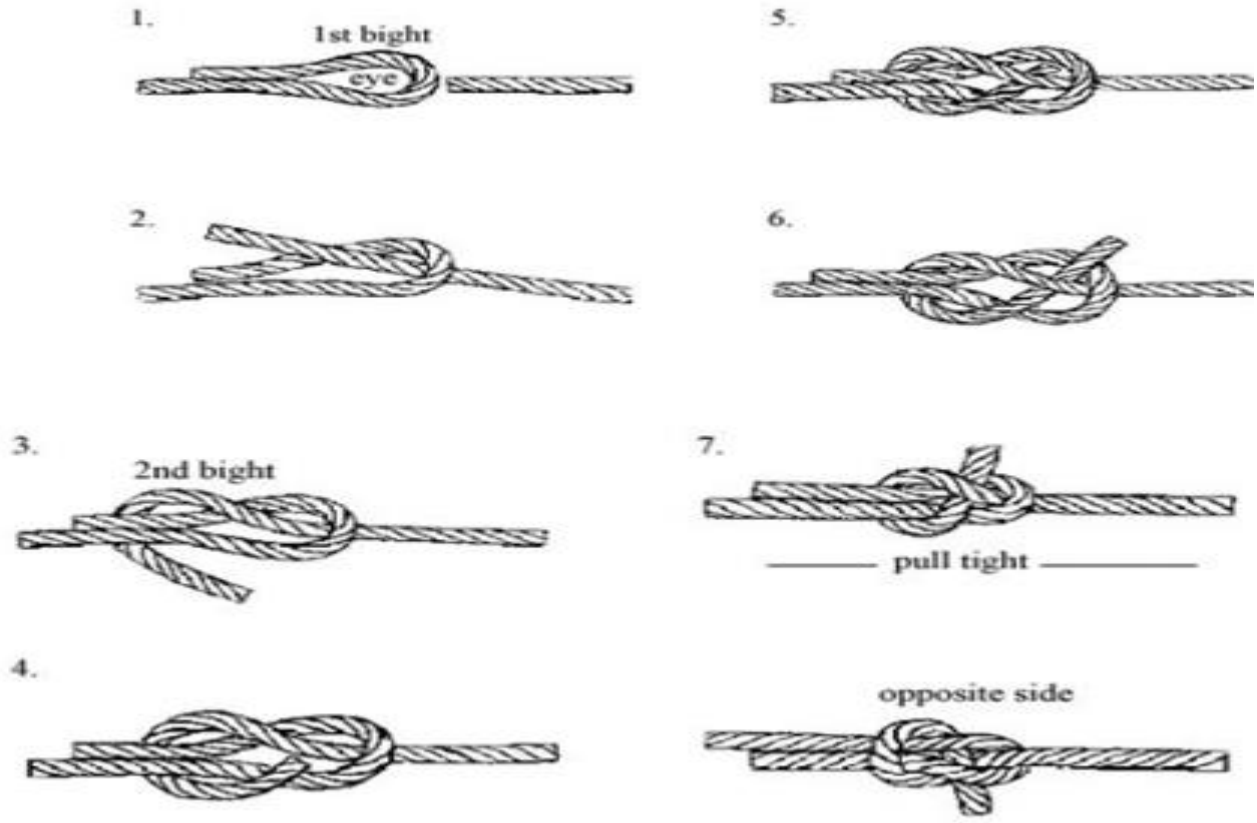

Fig. Weaver's knot

1.2. **Productivity:** It is the percentage equation expression the ratio between output and input

1.2.1. **Type's of productivity**

1. Productivity of machine
2. Productivity of worker
3. Productivity of material
4. Productivity of time

1.2.2. **The Factors that affecting Efficiency**

Many causes are responsible for losses of efficiency. The factors affect the efficiency of knitting production are given below:

1. Model to Model
2. Machine to Machine
3. Different model of same manufacture
4. Skill of operator
5. Faulty

1.2.3. **causes of production interruption**

- ❖ Yarn breakage
- ❖ Loose feeding of yarn
- ❖ Quality check during production

❖ Doffing	❖ Cone change	❖ Load shedding
❖ Counter stoppage	❖ Electric supply off	❖ Maintenance
❖ Cleaning	❖ Needle break	❖ Natural calamities

1.3. Description of causes of knitting Machine Stoppage

1.3.1. Cleaning by Blower

The machine needs to be cleaned with air blow when needed or a particular interval of time. Otherwise, fabric produced by the knitting machine will contain unwanted dirt-mark or have a fuzzy appearance. Moreover, if the fly and dirt accumulates in the needle - the knitting action of the needle will be faulty. It will limit the needle movement through the cams. It will result different fabric faults like drop stitches which may lead to set-off (Cloth fall-out) problem.

1.2.1. Yarn Breakage

Not only fiber-fly generation, has un-waxed yarn broken more. Generally, the knitting yarns waxed with paraffin wax to decrease the yarn breakage rate. The cause of yarn breakage is due to increase in friction with needle, guide and different tension devices. During knitting the yarn passes through different yarn guide, yarn tensioners and finally knitted by the needle.

- If the above-mentioned machine parts have sharp edges. The yarn will break. Again, if the tension of the yarn is high the yarn breakage rate will be high .If the speed of knitting machine is high; the yarn breakage rate will be high. If the atmospheric temperature is high and contains less moisture – the yarn will be dry and will lead to yarn breakage.

1.2.2. Needle Breakage: If the tension in yarn is more

- It will cause the needle to bend. The bent needle will lead to needle breakage. The yarn by which we are producing fabric is also a source of fiber-fly. This fiber-fly mixed with oil and lubricants of machine may limit the needle movement by clogging the cam track and will lead to needle breakage. Yarn containing large knots, slubs causes needle to break

1.2.3. Set – off

- In dry atmosphere the yarn acts lively which leads the newly formed loop to drop out from needle. Again, set-up problem will occur if the needle latch does not open clearly

1.2.4. Machine maintenance Schedule

Maintenance of knitting machine is very important that affect the machine efficiency, machine life and fabric quality. The management should prepare a maintenance schedule and it should be followed strictly. The main parts of the knitting machine should be checked with extreme care and responsibility. If the knitting machine is too old, then maintenance became

more important to avoid any major breakdown. The following are the guidelines for machine maintenance (Daily, Weekly, Monthly, Bi- Annually and Annually).

Self-Check -1	Written Test

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

1. Write down the type of productivity? (4 point)
2. what is the deference between yarn brake and needle breakage? (8 points)

Note: **Satisfactory rating – 8 and above points** **Unsatisfactory - below 8 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

   -

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

Information Sheet-2	Follow and recode counter read and data results as work requirements

2.1. Introduction

A row counter for hand knitting is a tally counter for counting rows or courses worked, for counting stitch pattern repetitions, or for counting increases or decreases of the number of stitches in consecutive rows. The first commercially produced one appeared on the market in the 1920s after the general public started regularly knitting from unfamiliar printed and complex patterns. Design variations include on-needle barrel-shaped counters for straight-needle work, stitch-marker counters for knitting on double-pointed and circular needles, complex counters which attempted to assist with decreases, increases and lacework, stand-alone hand-held counters in imitation of the hand-tally, pendant counters worn round the neck and online software for i-Phones

2.2. On-needle row counters

On-needle row counters seem to have appeared in the UK between 1920 and 1939, when complicated printed patterns increased in popularity among the working population. In the 1920s a 1 inch (2.5 cm) grey-brown enameled unit was manufactured with two rotary dials on the front showing tens and units, and slots on the back for sliding onto a knitting needle. The

front was flat and shaped like a figure-8, but was heavier than the back so that the unit hung downward from the needle, making the numbered face difficult to read.

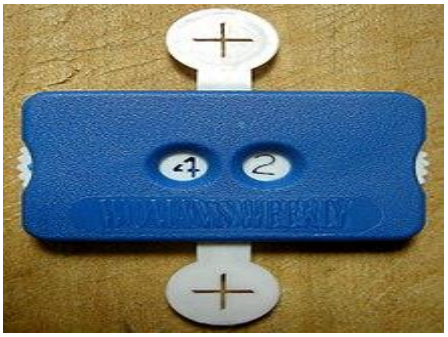

Fig.3.1. flat-faced on-needle counter

It was presented as a self-assembly kit, in a small blue envelope with assembly instructions and a diagram on the back. According to the diagram, the gadget consists of

a. two blue front and back plates, pierced to show the numbers;
b. an inner white soft plastic frame to hold the number discs and to which are attached the two loops to bend back and thread on the needle;
c. the two number discs. So the disks don't spin on an axis; they spin within circular spaces in the inner frame

2.3. Rotary barrel type

Products produced a brightly colored and marketable plastic row counter with patent number 424432. This was a barrel-shaped counter which sat in stable fashion on the knitting needle by the aid of a central metal spring. The assemblage consisted of a double rotating inner barrel and an outer fixed and slotted skin which was pinned to the central spring.

Fig.3.2. Ro-Tally on needle counters

2.4. Stitch-marker row counters

These tend to be on-needle barrel row counters which have been attached to stitch-marker rings. They are intended to be used with circular or double-pointed knitting needles. In the 21st century has marketed a dedicated stitch-marker row counter, labeling it the Universal Ro-tally

Fig.3.3. Stitch Marker counter

Self-Check -2	**Written Test**

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

1. Write down a type of yarn counter in knitting? (6 points)

Note: **Satisfactory rating – 4 and above points** **Unsatisfactory - below 4 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

Information Sheet-3	Make necessary adjustments in accordance with the instructions

3.1. Introduction

Circular knitting machine: is widely used throughout the knitting industry to produce fabric. This machine can be built in almost any reasonable diameter and the small diameter of up to five, which are used for wear. Machine for outerwear and under wear may vary from 12 inch to 60 inch in diameter according to manufactures requirement. This machine can be used either as fabric or for making garments completely with fancy stitch. **Latch needles** are commonly employed in all modern circular machines because of their simple action and also their ability to process more types of yarns

Fig.3.4. Circular Knitting machine

3.2. Important Parts of Circular Knitting Machine

3.2.1. Creel: Creel is a part of a knitting machine. Hear yarn package are store and ready to feed in the machine.

Fig.3.5. Creel

3.2.2. Pulley Belt: It controls the rotation of the MPF wheel

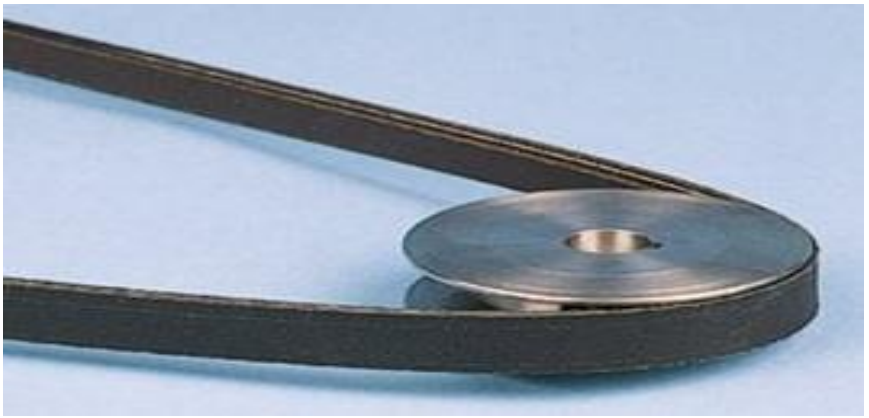

Fig.3.6. Pulley Belt

3.2.3. Brush: Its clean the pulley belt.

Fig.3.7. Brush

3.2.4. Tension disk: It confronts the tension of the supply yarn

Fig.3.8. Tenstion disc

3.2.5. Inlet and Outlet Stop Motion: It is an important part of the machine. It stops the machine instantly when a yarn is break.

Fig.3.9. inlet and outlet stop motion

3.2.6. Yarn Guide: Its help the yarn to feed in the feeder

Fig.3.10. Yarn Guide

3.2.7. MPF Wheel: Its control the speed of the MPF. Pulley belt gives motion to the wheel

Fig.3.11. Manager Positive Feed wheel

3.2.8. MPF: It is Mamenger positive feed. It is also an important part of the machine. It's give positive feed to the machine

Fig.3.12. MPF

3.2.9. Feeder Ring: It is a ring. Where all feeders are pleased together

Fig.3.13. Feeder ring

3.2.10. Disk Drum: Use in jacquard machine to produce various types of design

Fig. 3.14 Disk drum

3.2.11. Pattern Wheel: Pattern Wheel use in Pai Lung and Auto Stripe machine because of that that help to produce various types of design and stripe

Fig.3.15. Pattern wheel

3.2.12. Feeder: Feeder is help yarn to feed in to the machine

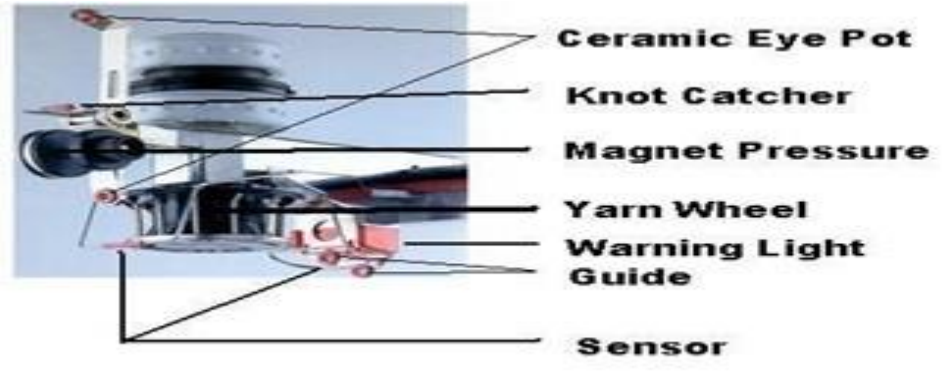

Fig.3.16. Feeder

3.2.13. Needle Track: Where all Needles is placed together in a decent design

Fig.3.17. Needle Truck

3.2.14. Needle: It is a principal element of the knitting machine. Its help the yarn to create a loop. And by this way fabric are produce. Prior to yarn feeding the needle is raised to clear the old loop from the hook, and received the new loop above it on needle stem. The new loop is then enclosed in the needle hook as the needle starts to descend

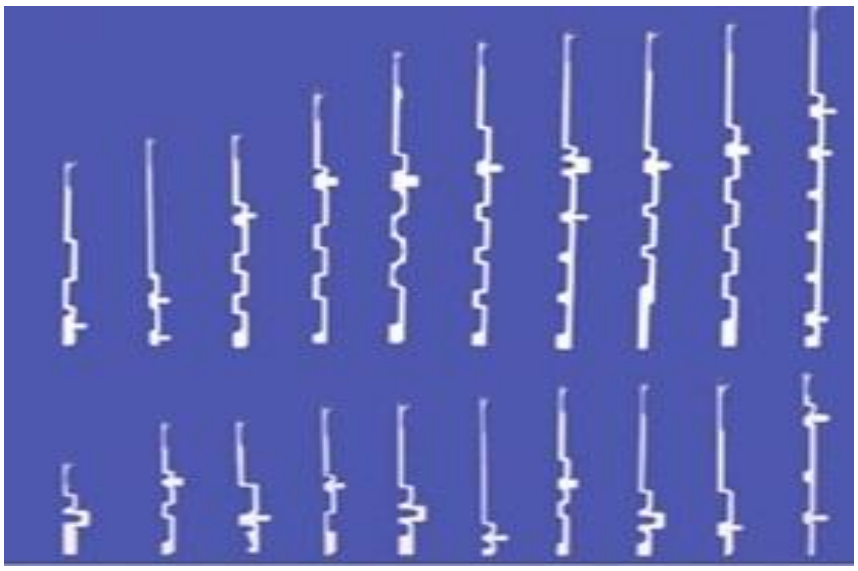

Fig. 3.18. Different Types of needle

3.2.15. Sinker: It is most important element of the machine. Its help to loop forming, knocking over and holding down the loop

Fig.3.19. Sinker

3.2.16. Sinker Ring: Sinker ring is a ring. Where all sinkers are pleased together

Fig.3.20. Sinker ring

3.2.17. Cam Box: Where the cam are set horizontally

Fig.3.21. Cam box

3.2.18. Cam: Cam is device s which converts the rotary machine drive in to a suitable reciprocating action for the needles and other elements

Fig.3.22. Cam

3.2.19. Cylinder: Needle track are situated hear

Fig. 3.23. Cylider

3.2.20. Cylinder Balancer: It helps the cylinder to set in a proper alignment.

Fig3.24. . Cylinder Balancer

3.2.21. Uniwave Lubrication: The Uniwave lubricator provides uniform lubrication to needles, cam tracks, lifters and other knitting machine components. The patented nozzle construction separates the air-oil mixture into air and droplets of oil

Fig.3.25. Uniwave Lubrication System

3.2.22. Adjustable Fan: This part removes lint, hairy fiber from yarn and others. To clean the dust by air flow

Fig.3.26. Adjustable

3.2.23. Expander: To control the width of the knitted fabric. No distortion of the knitting courses. Even take down tension in the knitting machine. As a result, an even fabric structure is achieved over the entire fabric width. The deformation of the knitted fabric goods can be reduced.

Fig.3.27 Expander

3.2.24. Needle Detector: This part detects the any type of faults of needles

Fig. 3.28. Needle Detector

3.2.25. Air Gun Nozzle: To feed the yarn; sometimes it is used for cleaning purpose

Fig. 3.29. Air Gun Nozzel

Self-Check -3	Written Test

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

1. List down at least 8 types of needle parts? (6 points)
2. what s the main important of air gun Nozzel? (8 points)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

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

Information Sheet-4	Monitor machine starting according to the instructions

4.1. Machine operation

MACHINE CONSIDERATIONS

After an evaluation of the new style and the fabric requirements is completed, the machine selection process is next. What is the best machine at your disposal that meets all of the construction and production requirements? What is the best selection of equipment to meet the weight, width, hand, performance properties, and production requirements of the new fabric construction? Other considerations of importance concerning the machine to be used include:

a. What is the best option in machine gauge and machine diameter to engineer the fabric to perform?
b. What is the mechanical condition of the machine?
c. How many machines will it take to produce the poundage or yardage needed?
d. What will be the speed factor and the number of feeds?
e. Are there enough machines in-house to fill the order or will off-site (company owned or commission) machines be used?
f. Will the new style require a change in preventative maintenance?

MACHINE EVALUATION

Once the machine selection process is completed, the next step is the evaluation of the machine's present mechanical condition and current fabric setup. The machine condition relates to cleanliness in general, the knitting elements, fabric tension, take-up mechanisms, and auxiliary devices. The machine should be clean, free from lint, wax buildup, and oil run offs. This is more of a housekeeping issue than a mechanical issue. However, any mechanical problem that relates to cleanliness should be repaired immediately upon disclosure and not at the next style change.

Knitting elements include needles, sinkers, cams, the cylinder, and the dial. If any of these elements are to be replaced or serviced, it should be done before the new style change. Also, all machine accessories (needle detectors, stop motions, flutter blowers, fabric scanners, tape feeders, etc.) need to be checked for proper settings and operation.

The next step is to check the current setup of the machine with regards to yarn count, type, stitch length, and course length. On all yarn feeders, the yarn should be wrapped properly and have approximately the same number of wraps.

If the yarn currently being used is similar to the same size as the yarn required by the new style, the existing yarn should be used to make the new style change since it is a known quality. It is important to then check the current yarn run-in or course length to accurately determine what changes need to be made for the new style. When changing to a much smaller or larger yarn, the stitch length must also be changed before removing the old yarn so that the machine will accept the new yarn without resulting in hole formation or pressing-off the old fabric.

MACHINE PREPARATION

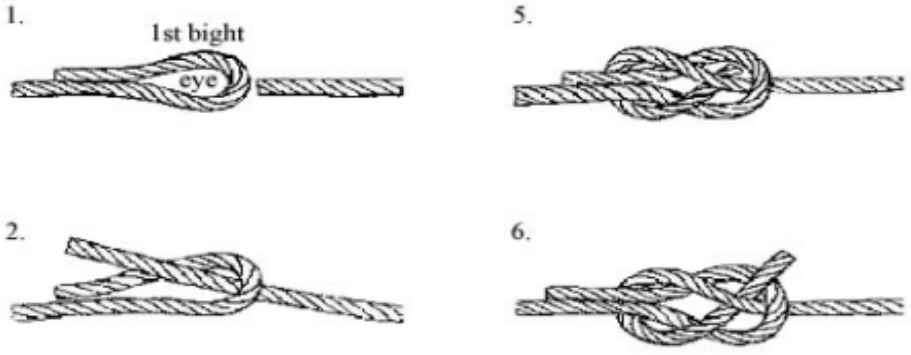
Before setting up the new style, it is necessary to clean, adjust, and thoroughly check both the machine and the creel. For example, all oil reserves should be full. The machine lubrication system should be working correctly and checked to ensure that the proper amount of lubrication is being applied. Lubrication would apply to oil and grease. Both the yarn feeding and fabric take-up systems should be examined to ensure proper functioning.

CHANGING THE STYLE

Yarn Creeling/Inspection

Whether the yarn is changed before or after the style is changed, it is important to handle the yarn packages in such a manner to ensure that proper yarn quality and package integrity has been maintained. More information on yarns for knitting can be found in Cotton Incorporated's Technical Bulletin TRI 2006 – Yarn Requirements For Knitting. The packages of yarn should be handled in such a manner that will not disturb the layers of yarn on the package. The yarn package transfer tail should not be unwound and allowed to hang loose under the package unless the machine is to be double creeled. If double creeled, a reserve package is tied to the actively knitting package. The leading end of the reserve package is tied to the trailing end of the active package. It is important to consider the characteristics of the "tail" of the packages. It is important to consider both the length of the tail and whether the tail is put inside the package, wrapped around the base of the package, or wrapped around the yarn post in the creel. The length of the transfer tail on the package should be between six and eight inches. If the yarn is tied to the reserve package, a *"weaver's knot"* (Figure 1) is preferred, because of its strength and small size. However, the *"overhand"* knot (Figure 2) is the most commonly used because of the speed and ease that it can be made. Whichever knot is used, remember to keep it as small as possible and clip the remaining tail to no longer then a one-tenth of an inch. Furthermore, the tail must not be exposed during knitting. If the tail is allowed to hang loose below the package, it can untwist and a weak area in the yarn will result. Lint will also accumulate on the tail if it hangs down below the yarn creel post and package. In any case, yarn breakage, holes, or machine downtime can result.

The yarn cones, upon which the yarn is wound, and the post, upon which the packages sit for support, are important, because they can often determine how well the yarn unwinds and transfers in knitting. Irrespective of whether a paper or plastic cone is used, both the tip and base of the cone can become damaged thereby preventing unwinding and package transfer as even the slightest of nicks can cause yarn breakage or a machine stop. If a yarn position with a center post or spindle that goes all the way through the cone is used, care must be taken to ensure that the yarn cannot catch on the post.



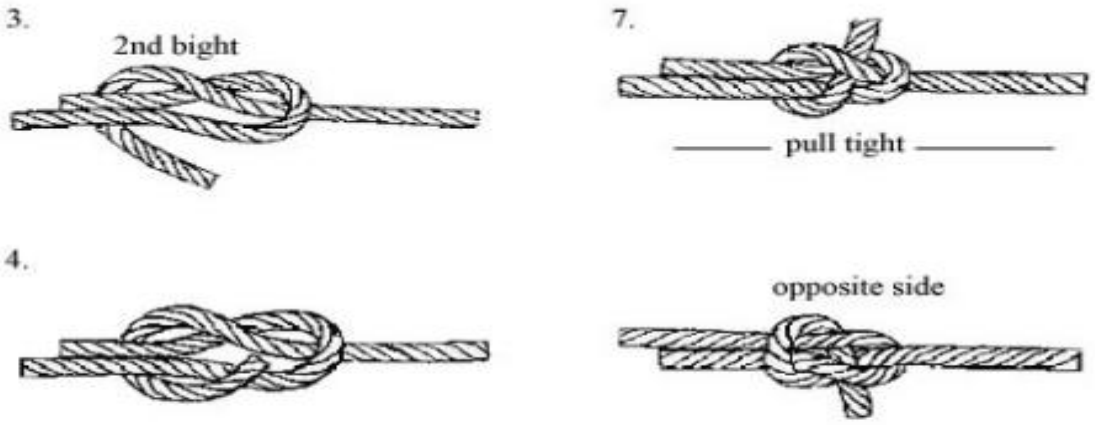


Figure 1 - Weaver's Knot

Figure 2 – Overhand Knot

Machine Settings Adjustment

After the desired yarn is creeled, the next step is to start putting the new style in place. Two methods are commonly used. One method starts at feed number one by removing the yarn from being fed from the positive feed system resulting in negative feeding. The needle selection should be changed to the new pattern and then the stitch length should be set. Each feed on the machine should be adjusted in the same manner. It is best to start at feed one and move in a sequential order around the machine until all have been adjusted and set the same way. After this has been accomplished, slowly turn the machine to check that the proper adjustments have been made. For single knit constructions, any adjustments of the sinker cams or sinker timing should be performed at this time. For double knit constructions, any adjustments of the dial height, gating, or needle timing should be done at this time.

The next step is to take the first feed, engage the positive feeder, if applicable, and adjust the course length by using an inch meter or run-in gauge and make adjustments by changing the quality wheel. After adjusting to the desired course length, adjust the yarn tension to the desired level by adjusting the stitch cam while reading a tension meter. After the first feed has been adjusted to the proper course length and yarn tension, the positive feed system can be engaged on the remaining feeders one at a time, while adjusting to the proper stitch length and yarn tension by using just the tension meter.

The other method most commonly used also starts with disengaging the positive feed system if applicable, and then changing all feeds to the proper needle selection and adjusting the stitch length all at one time instead of one at a time. The procedure for setting the yarn tension course length in the first method can be used in this method.

Adjusting Spreader Takedown

Once the machine has been metered for the proper course length and yarn tension, several revolutions should be run at a slow speed to check and adjust the fabric takedown to ensure proper fabric tension. Incorrect fabric tension can cause fabric defects as well as damage to the needles and cams. While adjusting the takedown to the proper setting, the fabric spreader system

should be adjusted to allow for fabric winding without wrinkles and folds (Figure 3). The takedown roller spacers should be adjusted to prevent the fabric from being pinched and creased on the edges (Figure 4). Takedown roller pressure must also be checked. The roller pressure on both sides should be uniform so that the fabric cannot slip and/or form linear creases (Figure 5).

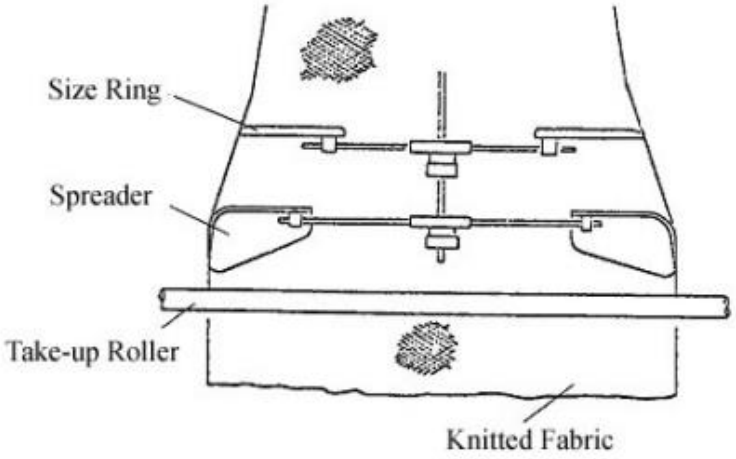


Figure 3

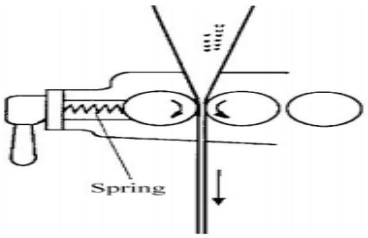


Figure 5

Yarn Path System Check

After the style has been changed and the machine has been run at slow speed, it is time to thoroughly re-check all machine systems. This includes checking all detectors, which includes cylinder needle, dial needle, and fabric build-up or defect detectors, to ensure that they are properly set for the new style. Make sure that yarn carriers are aligned and stop motions are working properly (Figure 6).

Double check to determine that the creel is working properly and that the yarn has been creeled with the right yarn in the proper position and manner. It is also a good practice to remove the old yarn completely from the creel to prevent it from being mixed with the new yarn in the creel (Figure 6).

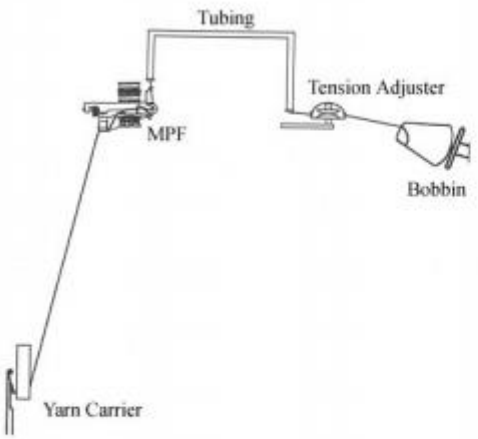


Figure 6

FABRIC STYLE CHECK

At this time, the fabric should be run at production speed to check the run-ability (how well the fabric knits) of the new style. A one-yard long sample should be cut for inspection.

The fabric should be checked for proper construction and appearance. Another one-yard sample should be allowed to relax while laying flat under no tension and checked for fabric weight and width. If the fabric weight, width, or pattern needs to be changed, then follow the prescribed procedure for setting the course length and yarn tension.

Another method for evaluating the new style is to launder the sample or even to dye a one or two yard piece. Many times by washing and tumble drying a sample piece, problems such as edge lines, miss selections of the stitch, miss creeling, fabric defects (i.e. barré, holes, etc.) and pattern defects will show up. Dyeing in many cases may allow for defects in both the yarn and fabric to be more easily seen.

STYLE RECORD KEEPING

Once the fabric and machine have been checked to confirm that everything has been set properly and that the fabric specifications have been met, the style should be recorded. A set-up sheet should be used that gives all the fabric information for historical reasons. Also, this information can be used for reproduction of the style at a later date. It is also recommended that a small fabric sample be cut and put into the fabric style folder.

Self-Check -4	Written Test

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

1. Write the main operation system for knitting machine? (10 points)
2. write down the adjustment systems of knitting machine? (12points)

Note: **Satisfactory rating - 18 and above points** **Unsatisfactory - below 18 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ---

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2. ---

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Information Sheet-5	Check proper yarn feeding system according to work specifications

5.1. How to passage of yarn in circular knitting machine:

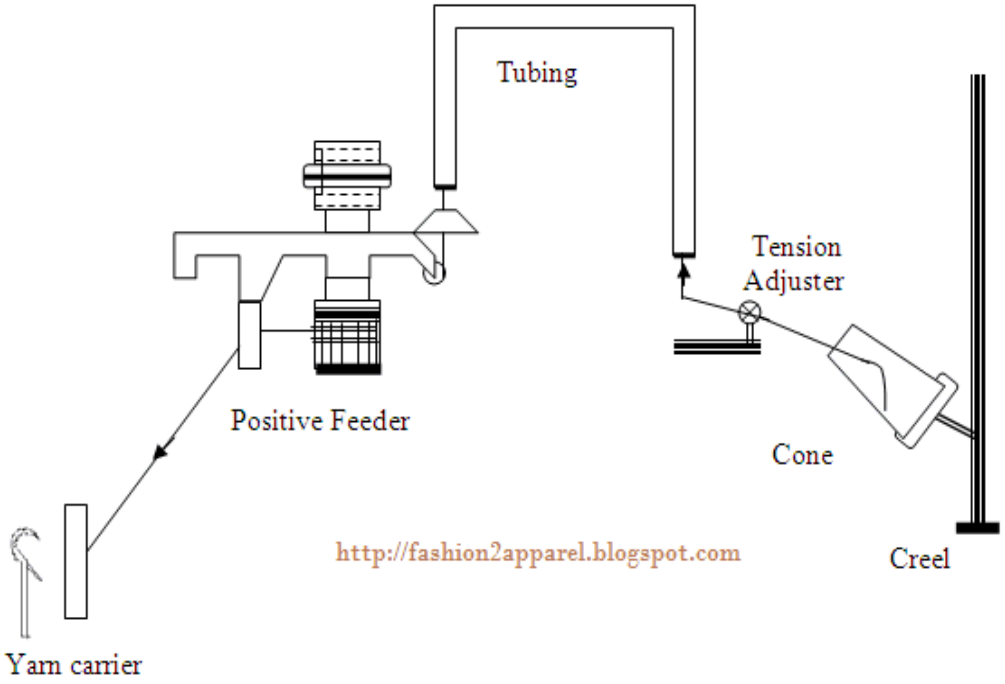

Fig.5.1 Passage of yarn in circular knitting machine

5.2. Yarn path from creel to needle in circular machine:

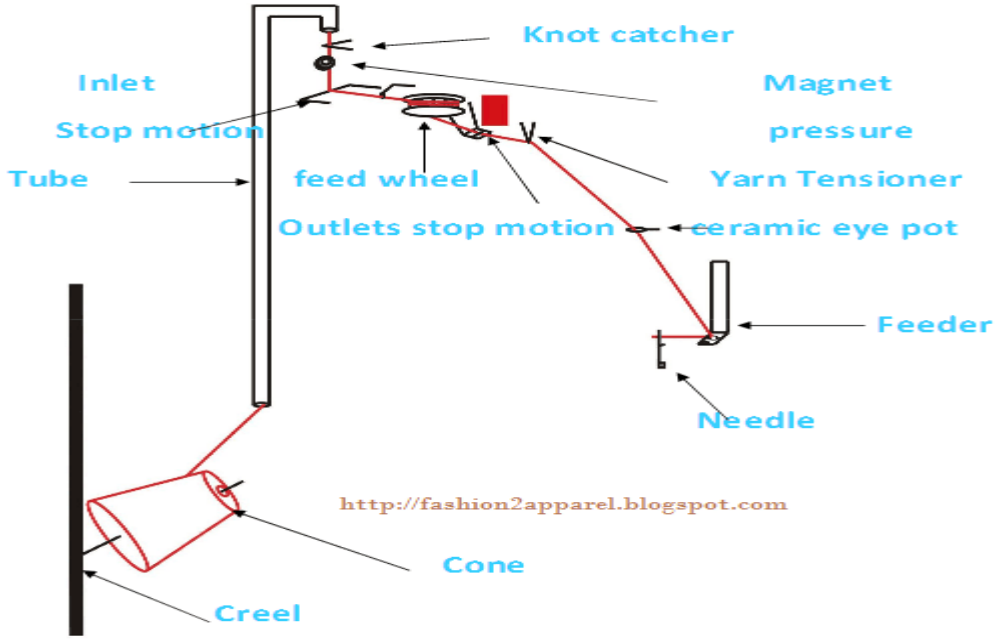

Fig: 5.2 Yarn paths from creel to needle

5.2.1. **Parts of circular knitting machine and their function:**

Working principle of circular knitting is done by the following parts:

- **Creel:** This is used to place the yarn cone, from where the yarn is supplied to m/c, through pipe.
- **Yarn Guide:** Which is used to guide the yarn, Yarn guide is necessary for maintaining proper tension on yarn during kitting.
- **Yarn Tensioner:** Yarn tensioner is requiring to proper gripping of yarn by needle.
- **Feeder:** Feeder is directly related to the production. e.g. if no of feeder is high then production will be high and vice versa.
- **Cylinder:** Cylinder is an important part of knitting m/c through which needles are set. During selection of knitting m/c for specific types of knitting cylinder gauge is an important parameter.
- **Needle:** The main part of knitting m/c is needle, without needle it is impossible to knit garments. In knitting m/c there are many types of needle may be used, like latch needle, bearded needle, compound needle but latch needle are very popular in knitting.
- **Cam box:** Cam box is used to hold the cam according to the fabric design. Knitting cams are arranged according to the design, e.g. arrangement of knit, tuck & miss cam.
- **Sinker: Sinker** is essential for knitting garments. Sinker is used to hold & support the thread during the loop formation. In knitting different shape of sinker is used.
- **Pulley:** pulley is very important in maintaining proper stitch length.
- **Base plate:** Base plate is circular shaped body, on which cylinder is situated.
- **Take-up roller:** Take-up roller is used to take the knitted fabric from m/c, which also maintains the proper tension on knitted fabric.
- **Body:** Body of m/c is the whole area of m/c, through which base plate, cylinder consist.
- **Auto Stopper:** Auto stopper is used to automatically stop the m/c if any fault is occurred

Self-Check -5	Written Test

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

1. write down yarn path from the creel to the knitting needles?(6 points)
2. Mention the main parts of circular knitting machine? (8 points)

Note: **Satisfactory rating - 10 and above points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

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

Information Sheet-6	Check and replace yarn supply to a continuous flow of machine

6.1. Introduction

In warping machine used in a warp preparation process for a weaving machine, yarns drawn out from a multiplicity for yarn supply packages fitted to war per creels are taken up around a war per drum. Therefore an extremely large number of the yarn supply package corresponding to the number of warps for the weaving machine are supported by the war per creels on vertical planes at such intervals that the yarns being drawn out do not interfere with each other, for instance, a thousand and several hundreds of packages to the creels has been performed manually by the worker, by one package at a time

6.2. Warping creel

Before thinking about winding a specified number of yarns on a beam, first consider the problem of positioning the packages from which the yarn is taken in such a manner so as to facilitate the removal of yarn, it is logical, therefore, to build a frame of some sort to hold the packages this frame is known as a creel and its function is to hold the supply packages in a manner so as to facilitate warping to accomplish this purpose creels are equipped with package holders on which the supply packages are placed, tension devices to help maintain uniform tension throughout the creel, guides to direct charges created by the rubbing of the yarn against the various surfaces and stop motions to detect broken ends and/or empty packages

Independently of the warping system, the threads are fed from bobbins placed on creels. The creels are simply metallic frames on which the feeding bobbins are fitted, they are equipped with yarn, the creel capacity is the parameter on which the number of warping sections or beam s depends, it should be as high as the installation type and planning permit, the usual creel capacity amounts today to 800-1200 bobbins

A creel for supplying yarns from a plurality of respective packages to a take-up machine such as a warp winder has a support defining respective supply stations carrying the yarn packages, respective stationary brake elements on the supports at the stations each having a braking surface, respective tension-sensing deflectors at the stations, and guides for directing the yarns from the respective packages over the respective braking surfaces and around the respective deflectors. Respective movable jaws movable toward and away from the respective stationary jaws can be actuated via respective springs to press against the

yarns on the respective surfaces with a force capable of varying smoothly and sleeplessly up to a relatively high nominal level corresponding to high tension in the respective yarn

6.3. The creel size

The creel size is limited by two factors. The first of these is floor space. A creel must be housed in the building and therefore it necessarily uses some of the facilities of that building the second factor is the yarn itself. In theoretical discussions, yarn weight, especially for short lengths of yarn, is neglected.

In considering a very large creel, it is obvious that some of the supply packages must be very much further away from the distance where the beam is being formed than others. Also, the yarn must be supported to keep it from dragging on the floor and tangling. Each support acts as a capstan tension device. Thus, it is important to keep the packages in a distance range where the effect of yarn weight and the effect of supports as pensioners may be neglected.

Hence the size and, therefore, the capacity of the creel are limited. In general, maximum creel capacity ranges from about 300 packages for very heavy yarns to 1400 packages for fine yarns.

6.4. Warping creel performance

Warping is a low yield operation owing to the time needed for creeling, various solutions have been conceived to minimize this time, by trying to perform the creeling of the full cones while the war per is running

The section warping machine is used for making patterned warps for weaving machine , the arrangement of colored threads in the warp sheet as per design is achieved by stacking colored packages on the creel in a suitable format, in a creel of about (400) packages the translation of warp pattern into stacking of colored package is quite complicated and time consuming, any mistake in placement of colored package on the creel will make a wrong pattern on the weaving machine and it cannot be rectified [6].

For the creeling of dyed yarns, a programmable electronic system has been studied; a warning light indicates the position where the yarn of a certain color must be creeled, this allows a time saving of 60% in creeling and avoids patterning faults and double ends

Trolley creels have generally two series of trolleys: one in operation and one waiting for being creeled, this system is suitable for staple fiber yarns in counts ranging from Nm 10 to Nm 140, for staple fiber yarns also mobile creels are used. These can be equipped with a series of trolleys for the transport of the reserve cones; as an alternative, two creels with stationary cone carrier frame are used together with the warper, in both cases the bobbins

are creeled during warping. Another solution employs swivel frames. While yarns are unwound from the bobbins placed in the inside of the creel, it is possible to creel at the outside of the creel the new lot of cones

We can use parallel creel with swiveling package frame sections or V- creel with reversible frames for cotton, viscose, polyester/cotton blended yarns, wool colored, but for polypropylene and monofilaments we can use parallel creel with unrolling draw-off . For luxury yarns and synthetic filaments the so-called magazine creels are used, which enable to creel two cones per creeling position and to piece head-tail end of two cones

Self-Check -6	Written Test

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

1. what is meant by warp creel performance?(8points)
2. what is meant by warp crelel in knitting? (6 points)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

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

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Information Sheet-7	Sort wastes and defects according to quality standard

7.1. Introduction

A defect of the knitted fabric is an abnormality which spoils the aesthetics i.e. the clean & uniform appearance of the fabric & effects the performance parameters, like; dimensional stability etc. There are various types of defects which occur in the Knitted fabrics of all types caused by a variety of reasons. The same type of defects may occur in the fabric due to a variety of different causes e.g. Drop Stitches, Spirality

7.2. Category of Defects:

Yarn Related Defects: Almost all the defects appearing in the horizontal direction in the knitted fabric are yarn related. These defects are mainly;

- ❖ Barriness
- ❖ Thick & Thin lines
- ❖ Dark or Light horizontal lines (due to the difference in dye pick up)
- ❖ Imperfections
- ❖ Contaminations
- ❖ Snarling
- ❖ Spirality

7.3. Knitting Elements Related Defects:

Almost all the defects appearing in the vertical direction in the knitted fabrics are as a cause of bad Knitting Elements. These defects are mainly;

- ❖ Needle & Sinker Lines
- ❖ Drop Stitches etc.

7.4. Machine Settings Related Defects:

These defects appear randomly in the knitted fabrics due to the wrong knitting machine settings &that of the machine parts. The defects are mainly;

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

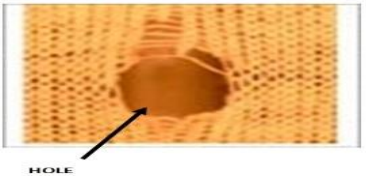

Fig. Hole Fabric

Major causes

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

b. Yarn Streaks

Streaks in the Knitted fabrics appear as; irregularly spaced & sized thin horizontal lines.

Causes

- Faulty winding of the yarn packages.
- Yarn running out of the belt on the Pulley

c. Barriness

Barriness defect appears in the Knitted fabric in the form of horizontal stripes of uniform or variable width. **Causes:**

- High Yarn Tension
- Count Variation
- Mixing of the yarn lots
- Package hardness

d. Fabric press off

Fabric press off appears as a big or small hole in the fabric caused due to the interruption of the loop forming process as a result of the yarn breakage or closed needle hooks. Press off takes place, when the yarn feeding to both the short butt & long butt needles suddenly stops due to the yarn breakage. At times complete fabric tube can fall off the needles if the needle detectors are not functioning or are not properly set.

Causes:

- End breakage on feeders with all needles knitting.
- Yarn feeder remaining in lifted up position due to which the yarn doesn't get fed in the hooks of the needles

e. Broken ends

Broken ends appear as equidistant prominent horizontal lines along the width of the fabric tube when a yarn breaks or is exhausted.

Causes:

- High Yarn Tension
- Yarn exhausted on the Cones

f. Spirality

Spirality appears in the form of a twisted garment after **washing**.The seams on both the sides of the garment displace from their position & appear on the front & back of the garment.

Causes:

- High T.P.I. of the Hosiery Yarn
- Uneven Fabric tension on the Knitting machine.
- Unequal rate of Fabric feed on the Stenter, Calender& Compactor machines.

Self-Check -7	Written Test

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

1. what are the types of defects in knitting products ?(8 points)
2. what are the types of knitting machine? (4 Points)

Note: **Satisfactory rating - 8 and above points** **Unsatisfactory - below 8 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

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

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

   -

Information Sheet-8	Identify minor product process and machine faults

8.1. Introduction

A defect of the knitted fabric is an abnormality which spoils the aesthetics i.e. the clean & uniform appearance of the fabric & effects the performance parameters, like; dimensional stability etc. There are various types of defects which occur in the Knitted fabrics of all types caused by a variety of reasons. The same type of defects may occur in the fabric due to a variety of different causes e.g. Drop Stitches, Spirality etc

8.2. Miner defects

Minor defects are usually small, insignificant issues that **don't affect the function or form of the item**. In most cases, the customer wouldn't even notice a minor defect on a product. And the customer wouldn't likely return an item due to a minor defect alone. Importers often set the highest tolerance, if applying that standard—for minor defects in their inspected sample size. But an item can still fail inspection if the number of minor defects found exceeds the limit set by their tolerance

- **Minor defect:** Untrimmed thread – these are a common quality issue in garment manufacturing. Factories can easily rework this defect by simply cutting the excess threads. You might also classify untrimmed threads as a major defect depending on your customers
- **Minor defect: Surface imperfections** – a surface imperfection like a welding protrusion on a steel pipe typically won't affect the use or functionality of an industrial product. But consider both the type of imperfection and the product's intended use before classifying such a defect as minor.

Defect description	Defect classification		
	Critical	Major	Minor
Uncut thread end			X
Wrinkle			X
Uneven stitches			X
Right/left foot position reversed inside shoe box			X
Open seam		X	
Loose yarn		X	
Broken yarn		X	
Wrong sizing within same pair		X	
Protruding nail or sharp point	X		
Missing suffocation warning	X		
Mildew or mold on shoe	X		

-

8.3. **This defect classification information can help**:

- Improve your supplier's ability to proactively self-identify and correct quality defects before outside inspection
- Ensure more accurate inspection results that match your quality tolerances and expectations
- Reduce any cases of "pending" results reported by the inspector due to unclear quality tolerances
- This defect classification list might extend to include 20 or even 30 different types of defects depending on your product type. The more information you can provide, the better prepared your QC team and supplier will be

8.4. How to address quality defects with your products

- Identifying quality defects in your order before shipment is essential to ensuring your goods meet your customers' expectations.
- Third-party inspection companies can inspect your order and report to you the number and types of defects found in the inspected sample size. Their report will typically show you the total number of defects found in comparison to the number of defects allowed based on your tolerances.
- The order will fail inspection if the number of defects found exceeds the allowed number. As you can see in the below excerpt, this order would fail inspection due to the number of minor defects exceeding the allowed number

Defect description	Defect classification		
	Critical	Major	Minor
Uncut thread end			11
Wrinkle			3
Uneven stitches			2
Open seam		2	
Loose yarn		1	
Broken yarn		2	
Total defects found	**0**	**5**	**16**
Total defects allowed	**0**	**10**	**14**

Glossary of Defects

Defect	Cause	Severity
Skewed or Bias	Condition where filling yarns are not square with wrap yarns on woven fabrics or where courses are not square with wale lines on knits.	Major or Minor
Back Fabric Seam Impression	Backing fabric is often used to cushion fabric being printed. If there is a joining seam in the backing fabric, an impression will result on printed fabric.	Major
Barre	Occurs in circular knit. Caused by mixing yarn on feed into the machine. Fabric will appear to have horizontal streaks.	Usually Major
Birds Eye	Birds eye often caused by unintentional tucking from malfunctioning needle. Usually two small distorted stitches caused side by side.	Major or Minor depending on severity
Burl Mark	When a slub or extra piece of yarn is woven into the fabric, it is often removed by a “burling tool.”This will usually leave an open place in the fabric.	Major
Bowing	Usually caused by finishing. Woven filling yarns lie in an arc across fabric width. It is critical on stripes or patterns and not as critical on solid color fabrics.	Major or Minor
Broken Color Pattern	Usually caused by colored yarn out of place on the frame.	Major
Color Out	Color out is the result of color running low in a reservoir on the printing machine.	Major
Color Smears	Color Smears are the result of color being smeared during printing.	Major or Minor
Crease Mark	Differs from crease streak in that streak will probably appear for an entire roll. Crease mark appears when creases are caused by fabric folds in the finishing process. Often	Major

Defect	Cause	Severity
	discoloration is a problem.	
Crease Streak	Occurs in tubular knits. Results from creased fabric passing through squeeze rollers in dyeing process.Depending on the product.	Usually Major
Drop Stitching	Drop stitching results from malfunctioning needle or jack appearing as holes or missing stitches.	Major
Dropped Pick	Caused by the filling insertion mechanism on a shuttleless loom not holding the filling yarn,causing the filling yarn to be woven without tension. The filling yarn appears as “kinky”.There will also be areas of “end out”.	Major
Drawbacks	Caused by excessive loom tension gradually applied by some abnormal restriction. When the restriction is removed the excess slack is woven into the fabric. Usually the ends are broken	Major
Dye Streak in Printing	Results from a damaged doctor blade or a blade not cleaned properly. Usually a long streak until the operator notices the problem.	Major
End out	Caused by yarn breaking and loom continuing to run with the missing end.MajorJerk-in Caused by an extra piece of filling yarn being jerked part way into the fabric by the shuttle. The defect will appear at the selvage.	Usually Major
Hole	Holes in fabrics are usually caused by the broken needle.	Major
Jerk In	Jerk Ins is caused by an extra piece of filling yarn being jerked part way into the fabric by the shuttle. The defect will appear at the selvage.	Major or Minor

Defect	Cause	Severity
Knots	Knots are caused by tying spools of yarn together.	Usually Minor
Missing Yarn	Occurs in circular knit. Caused by one end of yarn missing from feed and machine continuing to run.	Major
Mixed Filling	Caused by bobbin of lightweight yarn or different fiber blend used in filling. Will appear as a distinct shade change.	Major
Mixed Yarn	Mixed yarn is a different fiber blend used on the warp frame, resulting in a streak in the fabric.	Usually Major
Mottled	Mottles occurs when colors applied unevenly during printing.	Major or Minor
Needle Line	Needle Line is caused by bent needle forming distorted stitches in a vertical line.	Major or Minor
Open Reed	Open reed are the results from a bent reed wire causing warp ends to be held apart, exposing the filling yarn.	Major
Pin Holes	Pin holes along selvage caused by pins holding fabric while it processes through tender frame. Major> if pin holes extend into the body of fabric far enough to be visible in the finished product	Major
Press Off	Press Off occurs when all or some of the needles on circular knitting fail to function. Fabric either falls off the machine or design is completely disrupted or destroyed.	Major
Printing Machine Stop Mark	Dye or ink smudged along the width of fabric as a result of the printing machine stopping.	
Print Out of	Caused by print rollers not being synchronized properly.	

Defect	Cause	Severity
Repair	This results in various colors of the design not being printed in the proper position.	
Puckered Selvage	Usually caused by selvage being stretched in finishing or by uneven wetting out in sanforization process.	Major
Runner	Runner is a caused by the broken needle. The runner will appear as a vertical line. Most machines have a stopping device to stop the machine when a needle breaks.	Major or Minor
Sanforize Pucker	Usually caused by defective spray heads resulting in uneven wetting out of Sanforize. Fabric will appear wavy or pucker when spread on cutting table. It is difficult to detect while inspecting on inspection machine with fabric under roller tension.	Major or Minor
Scrimp	Scrip is the result of fabric being folded or creased when passing through tender frames.	Major
Skewing	Skewing refers to a condition where filling yarns are not square with warp yarns on woven fabrics or where courses are not square with wale lines on knits. It happens when the fabric shrinks more perpendicular to the twill line than along the twill line.	
Slub	Slub refers to thick or heavy places in the yarn or flying waste yarn getting into yarn feeds during the spinning process. Slub and other inconsistencies are common in fabrics produced on vintage shuttle looms.	Major or Minor
Smash	Small caused by a number of ruptured warp ends that has been repaired	Major
Soiled Filling	Soiled filling is dirty oily looking spots on the warp or filling yarns, or on packaged-dye yarn.	Can be Major or Minor

Defect	Cause	Severity
Stop Mark	Stop mark occurs when the loom is stopped, the yarn elongates under tension. When the loom starts again, the slack is woven into the fabric.	Can be major or Minor
Straying End	Straying End is caused when an end of yarn breaks and the loose end strays and is knit irregularly into another area.	
Thin Place	Thin Place is often caused by the filling yarn breaking and the loom continuing to run until the operator notices the problem.	Major
Water Spots	Water spots are usually caused by wet fabric being allowed to remain too long before drying, Color migrates leaving blotchy spots.	Major
Pilling	Pilling refers to the forming of little-matted balls on the surface of knitted fabrics. Pilling occurs when soft yarn rubs against itself, resulting in tangled fibers and produces an uneven and worn look.	

Self-Check -8	Written Test

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

1. What is the difference between minor defect and major defects? (9 points?
2. what is the difference between major defects and critical defects? (10 points)

Note: **Satisfactory rating - 14 and above points** **Unsatisfactory - below 14 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ---

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2. ---

Information Sheet-9	Report major machine faults

9.1. Introduction

A defect of the knitted fabric is an abnormality which spoils the aesthetics i.e. the clean & uniform appearance of the fabric & effects the performance parameters, like; dimensional stability etc. There are various types of defects which occur in the Knitted fabrics of all types caused by a variety of reasons. The same type of defects may occur in the fabric due to a variety of different causes e.g. Drop Stitches, Spirality etc

9.2. Major Defects

Major defects are more serious than minor defects. A product with a major defect departs significantly from the buyer's product specifications. Major defects are those which could adversely affect the function, performance or appearance of a product. These defects are readily noticeable by the customer. And these defects would likely cause a customer to return the product, lodge a complaint or request a refund in response. Most importers set a lower limit for major defects than minor defects in their inspected sample size. They'll often accept an order with relatively few major defects. But they're likely to reject an order, or ask their supplier to hold or rework it, if the goods fail inspection due to an excessive number of major defects found

- **Major defect: Deep scratch on item logo** – damage to an item's logo is often considered a major defect. Scratches on the logo can be difficult to repair. And they're generally not tolerated in large number, as they can impact product salability and consumer perception of a brand.
- **Major defect: Non-critical dimensions out of tolerance** – minor deviances in dimensions are undesirable in finished goods but often won't impact the overall function of an industrial product. You might consider dimensional deviations more serious if they affect product function, performance or subsequent production processes

9.3. Critical defects

Critical defects are the most serious of the three defect types. Critical defects render an item completely unusable and/or could cause harm to the user or someone in the vicinity of the product. These defects put businesses at serious risk of product liability issues, lawsuits and product recalls. Many importers have a "zero tolerance" policy for critical defects in their orders commensurate with this risk. An item will often **fail product inspection if a single critical defect is found** within the order

- **Critical defect: Sharp point or burr on item** – sharp points can cause harm to the end user and are often cause for failing an inspection. These hazards often lead to product recalls, which is partly why importers commonly classify them as critical defects..
- **Critical defect: Rust** – corrosion before shipping can be a sign of accelerated degradation and product failure. Rust should be a serious concern for you if you're importing gas or water pipes, for example.

Defect description	Defect classification		
	Critical	Major	Minor
Uncut thread end			X
Wrinkle			X
Uneven stitches			X
Right/left foot position reversed inside shoe box			X
Open seam		X	
Loose yarn		X	
Broken yarn		X	
Wrong sizing within same pair		X	
Protruding nail or sharp point	X		
Missing suffocation warning	X		
Mildew or mold on shoe	X		

9.4. This defect classification information can help:

- Improve your supplier's ability to proactively self-identify and correct quality defects before outside inspection
- Ensure more accurate inspection results that match your quality tolerances and expectations
- Reduce any cases of "pending" results reported by the inspector due to unclear quality tolerances
- This defect classification list might extend to include 20 or even 30 different types of defects depending on your product type. The more information you can provide, the better prepared your QC team and supplier will be

9.5. How to address quality defects with your products

- Identifying quality defects in your order before shipment is essential to ensuring your goods meet your customers' expectations.
- Third-party inspection companies can inspect your order and report to you the number and types of defects found in the inspected sample size. Their report will typically show

you the total number of defects found in comparison to the number of defects allowed based on your tolerances.

- The order will fail inspection if the number of defects found exceeds the allowed number. As you can see in the below excerpt, this order would fail inspection due to the number of minor defects exceeding the allowed number

Defect description	Defect classification		
	Critical	Major	Minor
Uncut thread end			11
Wrinkle			3
Uneven stitches			2
Open seam		2	
Loose yarn		1	
Broken yarn		2	
Total defects found	**0**	**5**	**16**
Total defects allowed	**0**	**10**	**14**

Glossary of Defects

Defect	**Cause**	**Severity**
Skewed or Bias	Condition where filling yarns are not square with wrap yarns on woven fabrics or where courses are not square with wale lines on knits.	Major or Minor
Back Fabric Seam Impression	Backing fabric is often used to cushion fabric being printed. If there is a joining seam in the backing fabric, an impression will result on printed fabric.	Major
Barre	Occurs in circular knit. Caused by mixing yarn on feed into the machine. Fabric will appear to have horizontal streaks.	Usually Major
Birds Eye	Birds eye often caused by unintentional tucking from malfunctioning needle. Usually two small distorted stitches caused side by side.	Major or Minor depending on severity
Burl Mark	When a slub or extra piece of yarn is woven into the fabric, it is often removed by a “burling tool.”This will usually	Major

Defect	Cause	Severity
	leave an open place in the fabric.	
Bowing	Usually caused by finishing. Woven filling yarns lie in an arc across fabric width. It is critical on stripes or patterns and not as critical on solid color fabrics.	Major or Minor
Broken Color Pattern	Usually caused by colored yarn out of place on the frame.	Major
Color Out	Color out is the result of color running low in a reservoir on the printing machine.	Major
Color Smears	Color Smears are the result of color being smeared during printing.	Major or Minor
Crease Mark	Differs from crease streak in that streak will probably appear for an entire roll. Crease mark appears when creases are caused by fabric folds in the finishing process. Often discoloration is a problem.	Major
Crease Streak	Occurs in tubular knits. Results from creased fabric passing through squeeze rollers in dyeing process.Depending on the product.	Usually Major
Drop Stitching	Drop stitching results from malfunctioning needle or jack appearing as holes or missing stitches.	Major
Dropped Pick	Caused by the filling insertion mechanism on a shuttleless loom not holding the filling yarn,causing the filling yarn to be woven without tension. The filling yarn appears as “kinky”.There will also be areas of “end out”.	Major
Drawbacks	Caused by excessive loom tension gradually applied by some abnormal restriction. When the restriction is removed the excess slack is woven into the fabric. Usually the ends	Major

Defect	Cause	Severity
	are broken	
Dye Streak in Printing	Results from a damaged doctor blade or a blade not cleaned properly. Usually a long streak until the operator notices the problem.	Major
End out	Caused by yarn breaking and loom continuing to run with the missing end.MajorJerk-in Caused by an extra piece of filling yarn being jerked part way into the fabric by the shuttle. The defect will appear at the selvage.	Usually Major
Hole	Holes in fabrics are usually caused by the broken needle.	Major
Jerk In	Jerk Ins is caused by an extra piece of filling yarn being jerked part way into the fabric by the shuttle. The defect will appear at the selvage.	Major or Minor
Knots	Knots are caused by tying spools of yarn together.	Usually Minor
Missing Yarn	Occurs in circular knit. Caused by one end of yarn missing from feed and machine continuing to run.	Major
Mixed Filling	Caused by bobbin of lightweight yarn or different fiber blend used in filling. Will appear as a distinct shade change.	Major
Mixed Yarn	Mixed yarn is a different fiber blend used on the warp frame, resulting in a streak in the fabric.	Usually Major
Mottled	Mottles occurs when colors applied unevenly during printing.	Major or Minor
Needle Line	Needle Line is caused by bent needle forming distorted	Major or Minor

Defect	Cause	Severity
	stitches in a vertical line.	
Open Reed	Open reed are the results from a bent reed wire causing warp ends to be held apart, exposing the filling yarn.	Major
Pin Holes	Pin holes along selvage caused by pins holding fabric while it processes through tender frame. Major> if pin holes extend into the body of fabric far enough to be visible in the finished product	Major
Press Off	Press Off occurs when all or some of the needles on circular knitting fail to function. Fabric either falls off the machine or design is completely disrupted or destroyed.	Major
Printing Machine Stop Mark	Dye or ink smudged along the width of fabric as a result of the printing machine stopping.	
Print Out of Repair	Caused by print rollers not being synchronized properly. This results in various colors of the design not being printed in the proper position.	
Puckered Selvage	Usually caused by selvage being stretched in finishing or by uneven wetting out in sanforization process.	Major
Runner	Runner is a caused by the broken needle. The runner will appear as a vertical line. Most machines have a stopping device to stop the machine when a needle breaks.	Major or Minor
Sanforize Pucker	Usually caused by defective spray heads resulting in uneven wetting out of Sanforize. Fabric will appear wavy or pucker when spread on cutting table. It is difficult to detect while inspecting on inspection machine with fabric under roller tension.	Major or Minor

Defect	Cause	Severity
Scrimp	Scrip is the result of fabric being folded or creased when passing through tender frames.	Major
Skewing	Skewing refers to a condition where filling yarns are not square with warp yarns on woven fabrics or where courses are not square with wale lines on knits. It happens when the fabric shrinks more perpendicular to the twill line than along the twill line.	
Slub	Slub refers to thick or heavy places in the yarn or flying waste yarn getting into yarn feeds during the spinning process. Slub and other inconsistencies are common in fabrics produced on vintage shuttle looms.	Major or Minor
Smash	Small caused by a number of ruptured warp ends that has been repaired	Major
Soiled Filling	Soiled filling is dirty oily looking spots on the warp or filling yarns, or on packaged-dye yarn.	Can be Major or Minor
Stop Mark	Stop mark occurs when the loom is stopped, the yarn elongates under tension. When the loom starts again, the slack is woven into the fabric.	Can be major or Minor
Straying End	Straying End is caused when an end of yarn breaks and the loose end strays and is knit irregularly into another area.	
Thin Place	Thin Place is often caused by the filling yarn breaking and the loom continuing to run until the operator notices the problem.	Major
Water Spots	Water spots are usually caused by wet fabric being allowed to remain too long before drying, Color migrates leaving blotchy spots.	Major

Defect	Cause	Severity
Pilling	Pilling refers to the forming of little-matted balls on the surface of knitted fabrics. Pilling occurs when soft yarn rubs against itself, resulting in tangled fibers and produces an uneven and worn look.	

Self-Check -9	Written Test

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

1. What the types of defect that can be reported to the organization? (10 points)
2. write the difference between critical defects with that of minor defect?(10 points)

Note: **Satisfactory rating - 15 and above points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ---

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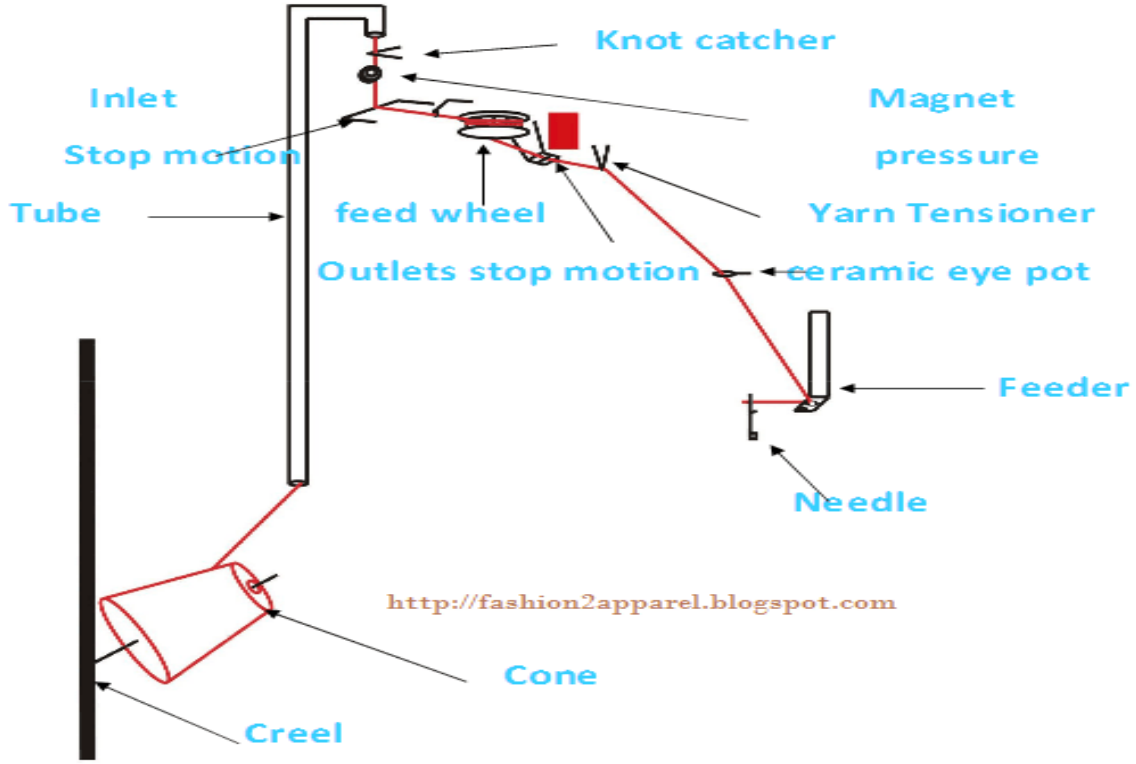
2. ---

Operation Sheet 1	Produce simple plain, rib and satin knitted product

Based on the figures given below show the techniques for identifying the arrangement of materials and machine operations.



Step 1- Collect the necessary information for knitting fabric formation

Step 2- List out all important raw materials, tools, equipment and machine

Step 3- Implement the correct machine setting and sequence for operation

Step 4. Apply Rib, satin and pain fabric formation system to test and analyze sample

Step 5. check the sample whether it meet the products according to the given design

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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 6 hour.

Task 1. Try to produce 20 cm width * 1.5 mete of plain knitted product

Task 2. Try to produce 20 cm width * 1.5 mete of rib knitted product

Task 3. Try to produce 20 cm width * 1.5 mete of satin knitted product

List of Reference Materials

1. ^ Jump up to: a b c d e f g h i *Rutt, Richard (1987). A History of Hand Knitting. B.T. Batsford Ltd, London. p. 248. ISBN 0-7134-5118-1.*
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