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1. Basic Textile Terms of Spinning:

Fiber: The fundamental component used in making textile yarns and fabrics. Fibers are fine substances with a high ratio of length to thickness. They can be either natural (e.g. cotton, wool, silk etc.) or synthetic (e.g. polyester, nylon, acrylic etc.).

Blow room Lap: finished product of blow room in the form of a sheet of fibers.

Chute feed system: It is a system of feeding small tufts of fibers directly from blow room to a series of cards, arranged in a circuit through pneumatic pipe.

Sliver: The strand of loose, roughly parallel, untwisted fibers produced in Carding, Draw frame.

Roving: A product of speed frame in the form of a soft strand of fiber that has been twisted, attenuated, and free from foreign matter preparatory to spinning.

Yarn: A continuous strand of textile fibers that may be composed of endless filaments or shorter fibers twisted or otherwise held together.

Spinning: The process of making yarns from the textile fiber is called spinning. Spinning is the twisting together of drawn out strands of fibers to form yarn.

Yarn Count/Sliver Hank

Yarn count is the numerical expression of yarn, which defines its fineness or coarseness. (Linear density)

Yarn count system:

Indirect system: English count (Ne), Worsted Count etc.

i.e. Higher the yarn number, Finer the yarn.

Direct System: Tex, Denier.

i.e. Higher the yarn number , Coarser the yarn.

Similarly numerical expression of fineness or coarseness of sliver & roving are called Hank.

Note: English (Ne) count system is commonly followed in India.

English Count: No. of Hanks of length 840 yds weighing in 1 pound

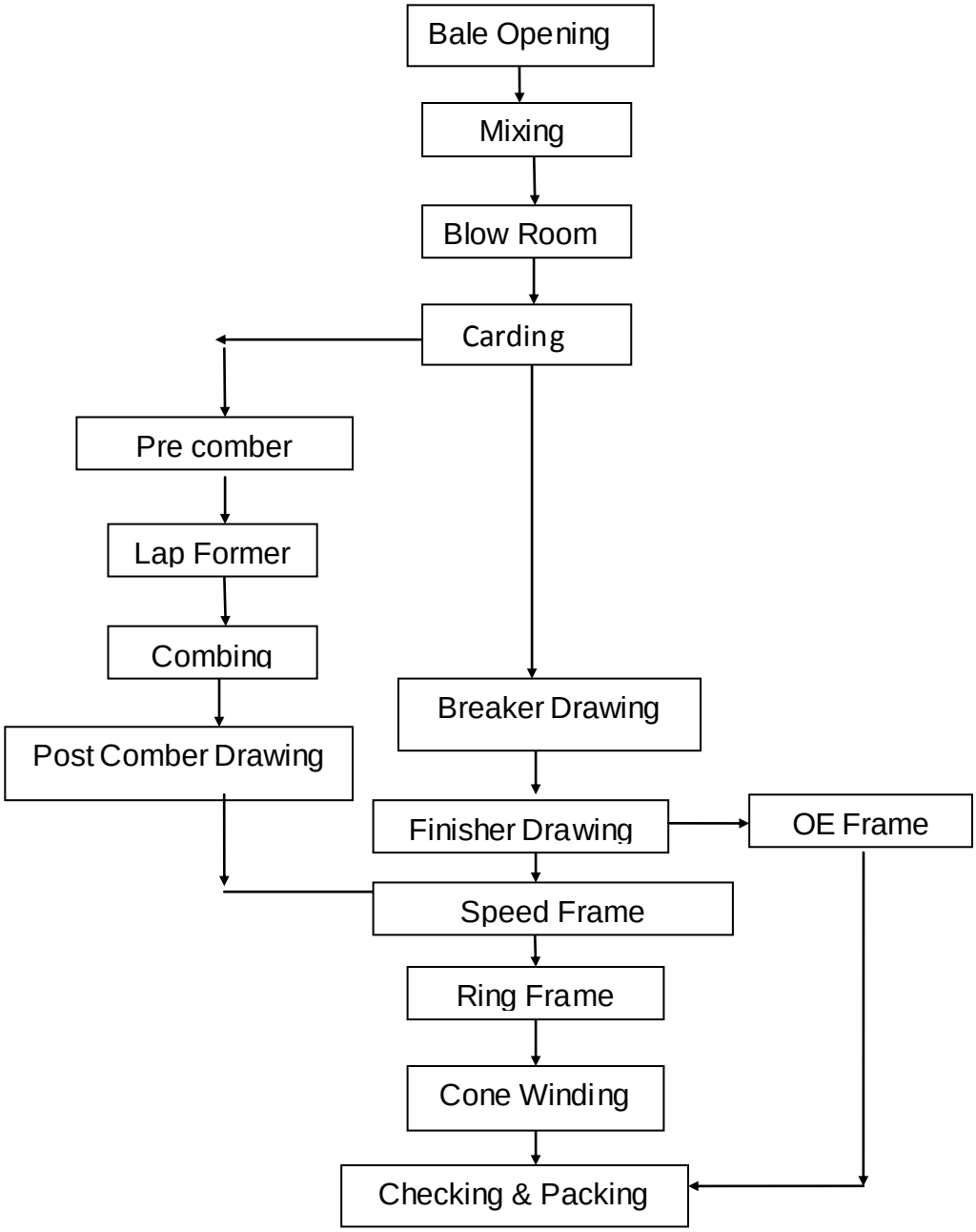
1yds: 0.9144 mtrs.

1lbs: 0.453 Kgs.

e.g. 40^{S} Ne = 40 hanks of 840 yds weighs 1 lbs.

20^{S} Ne = 20 hanks of 840 yds weighs 1 lbs.

2. Sequence of Spinning Process:



3. Material Flow in Spinning:

Carded Yarn Manufacturing:

TABLE-1

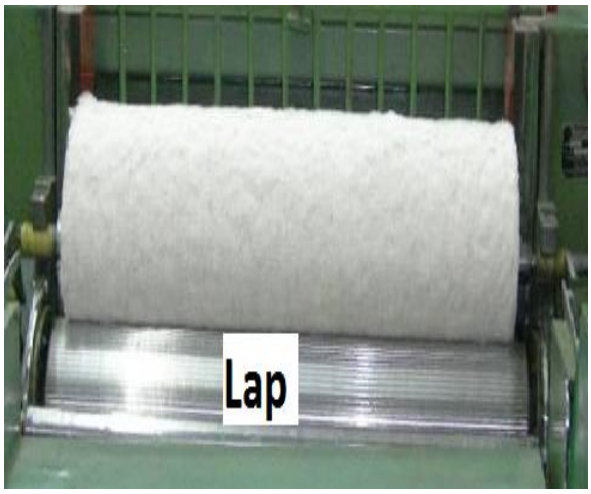
STAGE	MACHINE	INPUT MATERIAL	OUT PUT MATERIAL	PACKAGE FORM
Opening & cleaning	Blow Room machines	Raw cotton	Lap or chute feed	-
Carding	Card	Lap or chute feed	Card sliver	Slivers in Can
1st drawing	Breaker Draw frame	Card sliver	Drawn sliver	Sliver can
2nd drawing	Finisher Draw frame	Drawn sliver	Drawn sliver	Sliver can for Roving
Roving	Speed Frame	Drawn sliver	Roving	Roving bobbin
Spinning	Ring spinning frame	Roving	Ring-spun yarn	Spinning Cops
Post-Spinning processes	**Winding**	**Yarn in spinning cops**	**Yarn package**	**Cone, Cheese & Hank as required**

Combed Yarn Manufacturing

TABLE-2

STAGE	MACHINE	INPUT MATERIAL	OUT PUT MATERIAL	PACKAGE FORM
Opening & cleaning	Blow Room machines	Raw cotton	Lap or chute feed	-
Carding	Carding machine	Lap or chute feed	Card sliver	Carded Slivers in Cans
Pre comber Drawing	Breaker Draw Frame	Carded Sliver	Drawn Sliver	Drawn slivers in cans
Lap Formation	Super Lap or Lap Former	Drawn Slivers	Lap	Laps in spools
Combing	Comber	Lap	Combed Sliver	Combed sliver in Cans
Post comber Drawing	Finisher Draw Frame	Combed sliver	Drawn sliver	Post comber Draw frame slivers in cans
Roving	Speed Frame	Post comber Draw frame sliver	Roving	Roving bobbin
Spinning	Ring spinning frame	Roving	Ring-spun yarn	Spinning Cops
Post-Spinning processes	**Winding**	**Yarn in spinning cops**	**Yarn**	**Cone, Cheese & Hank as required**

Various Package Form:



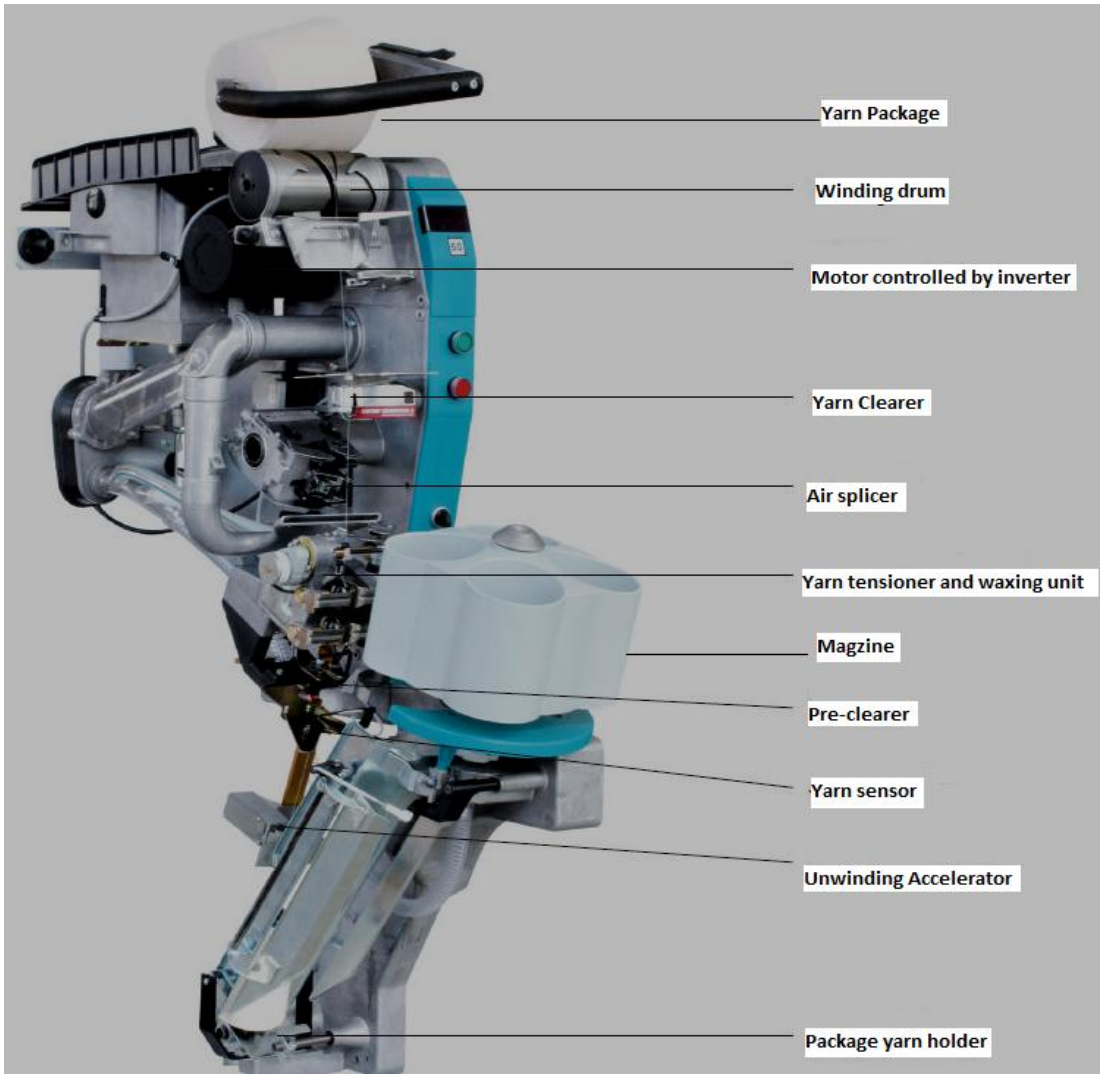
Roving Bobbin

4. Functions of Autoconer Machine:

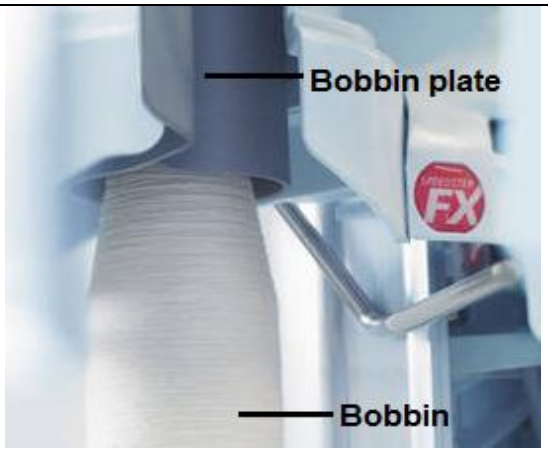
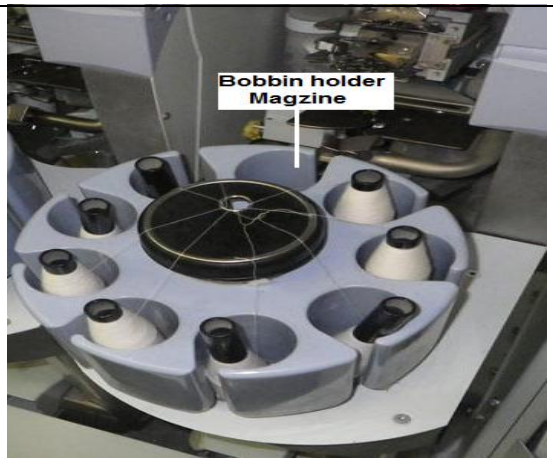
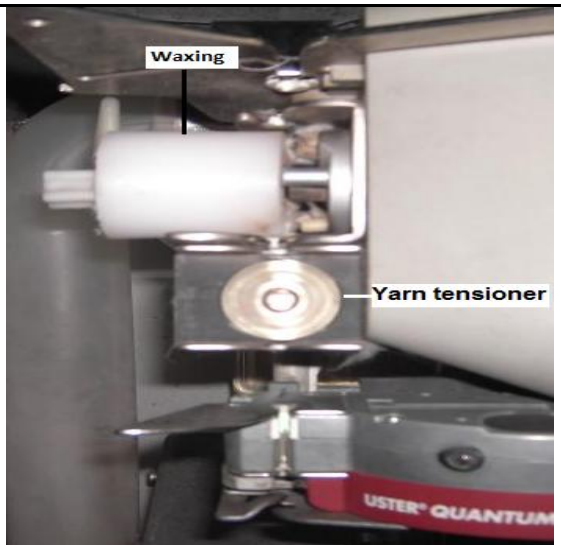
- To remove yarn faults.
- To improve the quality of yarn.
- To wax the yarn during winding process.
- To make bigger package from ring bobbin in order to get continuous length of yarn on cones for weaving/Knitting processes.

5. Details Auto Coner Machine:

Auto coner winding unit:



Main Parts of Autoconer:

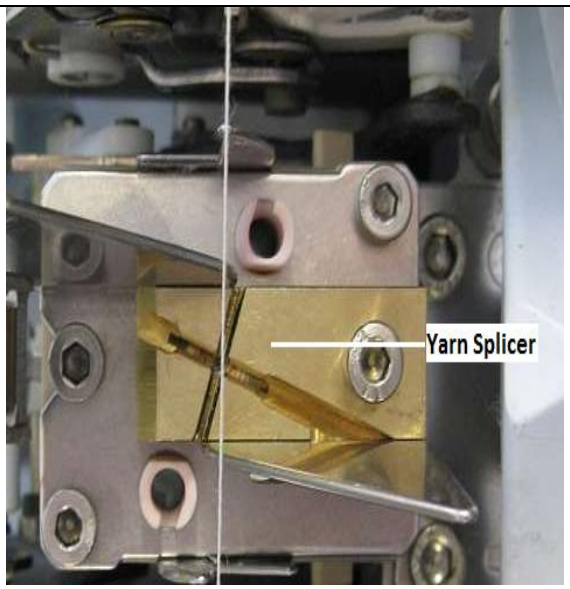
Bobbin Holder: It is a disk type wheel. Its functions is to hold the filled bobbins for unwinding process. **Bobbin plate:** The function of plate is to rotate the bobbins one by one.	
Bobbin Magazine: This is the main component of the auto coner machine. Its function is to hold the cops for winding.Its capacity lies up to 9 cops.	
Yarn tensioner & waxing unit: Yarn tensioner provides sufficient tension to the yarn during unwinding from cop to winding on to cones. Wax motor runs wax bush/roll continuously. Waxing makes the surface of the yarn smooth by sticking hairy fibres. Waxing is applied especially to the yarn intended for knitting.	

Yarn splicer:

Perfect spliced joints are one of the most important quality features of Autoconer packages. These are guaranteed by the unique, flexible and easy-to-operate splicing technology, based on the successful pneumatic splicing principle.The splicing mechanism performs the knot free joining of the two yarn ends after yarn breakage.Now a days air splicing is used.

Retie pipe:

It take the yarn end from bobbin toward splicing mechanism.



Yarn Cleaner: Its function is to remove the faults such as thin and thick places, neps, hairiness according to the set value.

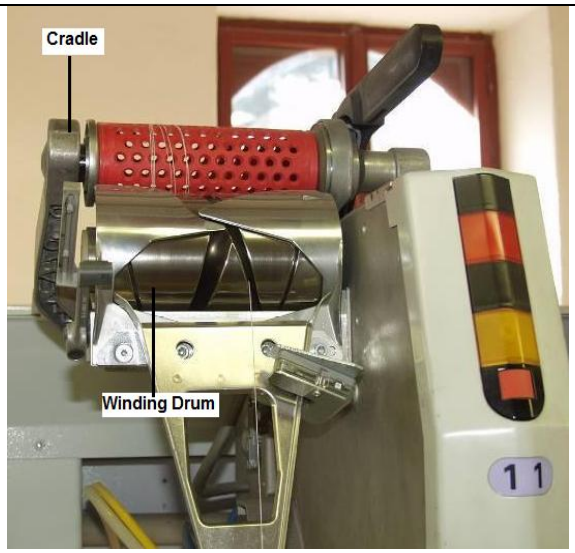
Cradle:

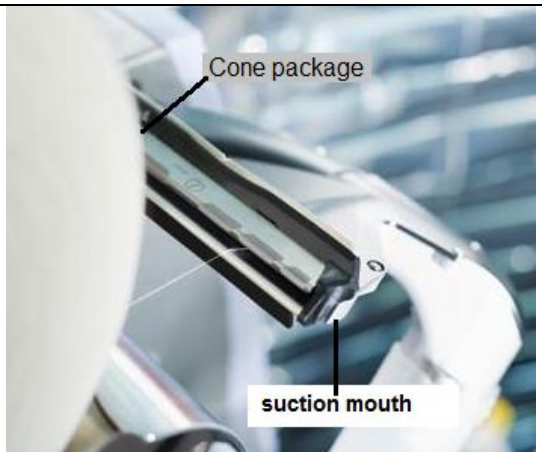
Its function is to provide setting to cone having package holders. It lies on upper part of machine on drum.

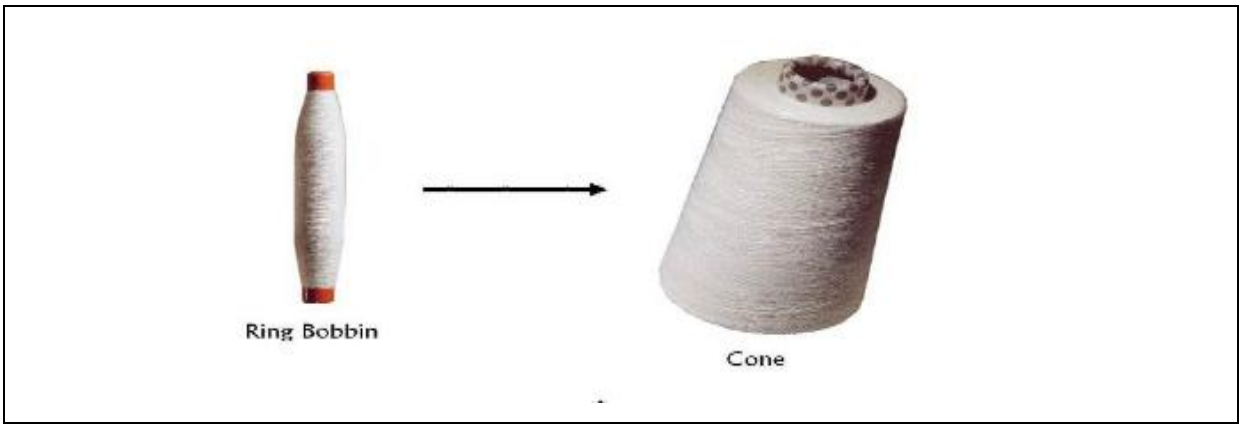
Winding drum:

It is a metallic drum and its surface is polished .It has cut marks or grooves cut in to it at its surface to help the cross winding of packages.

Waste suction pipe: During yarn cutting and splicing it sucks the waste yarn.



Suction mouth: When ever yarn breaks during winding the package move in opposite direction with slow speed during that time it sucks the broken yarn end from the package and take it for splicing	
Display Panel: It displays various operating machine parameters like speed, production, Count of yarn etc. Understand the details in the display panel and work accordingly	
Signal Lamps: Signal lamps are provided on the machine to indicate the reason for stoppage of drums. Understand each signal lamp and their purpose in the machine.	



6. Operating Autoconer Machine:

- Fill the required number of ring bobbins in magazine.
- Operate the control switches for starting and stopping winding unit.
- Follow the different signal lamps in machines.
- View the display panel and identify the reasons for drum stoppages if any.
- Inform the supervisor in case of any break-downs.
- Remove the drum lapping if any manually with suitable equipment without damaging the drum.
- Switch on air valve while restating the machine after every stoppage.
- See that the tension is as per requirement in drums
- Follow instructions/direction of supervisors, during count changes.
- Switch on the drum only after rectifying the problem.
- Check the splicing unit.
- Restart the winding unit if the winding unit is stopped on specified number of successive failures of splicing.
- Check the waxing roll is available if the yarn is to be waxed
- Put the waxes in the wax axle according to the material being processed as per the instruction of superiors
- Replace the new wax immediately if the wax indication alarm blinks.
- Check running waxes are clean and are freely rotating.
- Carryout doffing activity if auto doffing unit is not available in the Autoconer.
- Report to the supervisor and maintenance in charge if the yarn alarm and quality alarms rings
- Identify and report the different package defects to the supervisor.

- Transport empty cops to ring frame department.
- Carryout cleaning activities in bobbin magazine, bobbin holder, splicer zone, yarn cleaner zone & winding zone.
- Remove the suction waste periodically & segregate the wastes collected and put them in the designated bins.
- Always keep machine area clean.

Importance of Colour coding:

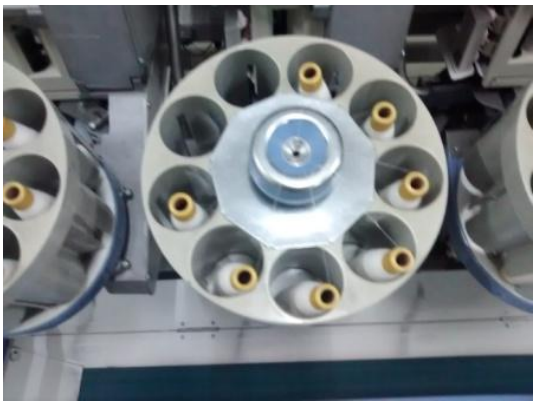
The details related to colour coding like Ring bobbin colour, empty cone tip colour and other relevant information like Count of yarn wound etc, are normally displayed in respective machine's display board. It is the responsibility of the machine operator to understand them & work accordingly.

Identifying Defects:

- Defects in spinning cops like, uneven cops, stained bunch of yarn etc., are to be identified and informed to supervisor for necessary action.
- Defects in cones like irregular shaped cones, soft or hard cones, stitches formation in cones, Ribbon formation etc are to be identified and informed to supervisor for necessary action.
- Defects such as yarn shade variation, strength variation, twist variation, stains etc. are to be identified and informed to supervisor for necessary action.

Filling the cops

- Bring the correct colour coded cops in the cop trolley from storage area for filling in magazine.
- Patrol around the winding machine and identify the cop exhaust in magazine.
- Fill the cops in the magazine.
- Check the cop is properly placed in the magazine.
- Check the yarn end of the cop is fed in the suction pipe at the centre of magazine
- Check the winding unit should not stop due to cops exhaust.



Doffing the cone package if no auto doffing unit is available

- Check the cone package is fully would to the predetermined length or weight and start doffing.
- Check the weight of the doffed cones.
- Either stop the machine for doffing or doff the cone package while the machine is running as per the instructions of the supervisor.
- Remove full cone package from cone holder.
- Place the cone in the cone trolley and store in the storage area as instructed.
- Reserve the correct colour coded empty paper cone in the reserve area for doffing.
- Keep the hard waste removed during doffing in separate waste collection boxes.

Restarting the winding unit after doffing

- Insert the empty cone after doffing
- Ensure strictly proper colour coded empty paper cone is mounted in holder.
- Put tail end as specified on the base of the empty cone before starting.
- During count change do the necessary changes as per the instructions of the supervisor.
- Release the cone holder and ensure the paper cone is in surface contact with the winding drum and ensure proper traverse of yarn on winding drum.
- Ensure the proper passage of yarn in Autoconer.

Cleaning of Auto coner machine & Waste disposal

- Clean the different mechanisms in auto coner at the scheduled interval as instructed
- Ensure the waxing rolls are clean
- Keep the wastes in waste bags, piecer bags, or in aprons.
- Properly handle full cops, empty cops and full cones
- Clean the waste accumulation from different parts of the machine from time to time.
- Use proper tools for cleaning.
- Collect the hard wastes from waste collection box in Autoconer machine at regular intervals as instructed by supervisor
- The rejected cops in the empties trolley should be segregated, cleaned and returned.
- All half cops and damaged cops should be cleaned in the particular shift itself.
- Ensure safety while carrying out cleaning activities.
- Clean the wastes in the alley around the Autoconer area.
- Ensure OHTC is running continuously.

General instructions while taking charge of shift

- Come atleast 10 - 15 minutes earlier to the work spot.
- Meet the previous shift operator and discus regarding the issues faced by them with respect to the quality or production or spare or safety or any other specific instruction etc.
- Understand the count produced, colour coding, followed in the auto coner for his allocated number of drums or machines.
- Check the technical details are mentioned in the display board in the auto coner.
- Check for the availability of the ring cops in trolleys.
- Check for the availability of the empty cones for the count running.
- Check all the cone drums are running properly, if any drum is idle enquire for the reason and report to the supervisor.
- Check the cleanliness of the machines & the work area.
- Check whether any spare/raw material/ tool / yarn / cops or any other material are thrown under the machines or in the other work areas.
- Check the Over Head Travelling Cleaner (OHTC) is working properly

7. Instructions while handing over at shift end

- Properly hand over the shift to the incoming shift operator.
- Provide the details regarding count produced, colour coding followed in the auto coner for his allocated number of drums or machines.
- Provide all relevant information regarding the count produced, idle drums, damaged machine parts if any.
- Collect the wastes from waste collection bags, weigh them and transport to storage area.
- Check whether the cleanliness of the work place.
- Get clearance from the incoming counterpart before leaving the work spot, in case if the next shift operators do not come report to shift supervisor.
- Report to the shift supervisor about the quality / production / safety issues/ any other issue faced in the shift and leave the department only after getting concurrence for the same from supervisor.

8. Importance of Health & Safety:

- Follow the work & safety instructions and adopt safe working practices like not opening the doors of the machine, not cleaning the interior parts & not taking any choked material when the machine is in running condition.
- Do not take the hands close to the splicing while it is in working.
- Always use head cap, face mask and ear plug in the work spot.
- Do not carry any metallic parts during machine running as there are chances of fire and damage to machine parts.
- Take action based on instructions in the event of fire, emergencies or accidents, participate in mock drills/ evacuation procedures organized at the workplace as per organization procedures.