

BLOW ROOM

Basic operations in the blowroom:

1. opening
2. cleaning
3. mixing or blending
4. microdust removal
5. uniform feed to the carding machine
6. Recycling the waste

Blow room installations consists of a sequence of different machines to carry out the above said operations. Moreover Since the tuft size of cotton becomes smaller and smaller, the required intensities of processing necessitates different machine configuration.

TECHNOLOGICAL POINTS IN BLOWROOM

- Opening in blowroom means opening into small flocks. Technological operation of opening means the volume of the flock is increased while the number of fibres remains constant. i.e. the specific density of the material is reduced
- The larger the dirt particle , the better they can be removed
- Since almost every blowroom machine can shatter particles, as far as possible a lot of impurities should be eliminated at the start of the process. Opening should be followed immediately by cleaning, if possible in the same machine.
- The higher the degree of opening, the higher the degree of cleaning. A very high cleaning effect is almost always purchased at the cost of a high fibre loss. Higher roller speeds give a better cleaning effect but also more stress on the fibre.
- Cleaning is made more difficult if the impurities of dirty cotton are distributed through a larger quantity of material by mixing with clean cotton.
- The cleaning efficiency is strongly dependent on the TRASH %. It is also affected by the size of the particle and stickyness of cotton. Therefore cleaning efficiency can be different for different cottons with the same trash %.
- There is a new concept called CLEANING RESISTANCE. Different cottons have different cleaning resistance.
- If cotton is opened well in the opening process, cleaning becomes easier because opened cotton has more surface area, therefore cleaning is more efficient
- If automatic bale opener is used, the tuft size should be as small as possible and the machine stop time should be reduced to the minimum level possible
- If Manual Bale openers are used, the tuft size fed to the feed lattice should be as small as possible
- Due to machine harvesting , cotton contains more and more impurities, which furthermore are shattered by hard ginning. Therefore cleaning is always an important basic operation.
- In cleaning, it is necessary to release the adhesion of the impurities to the fibres and to give the particles an opportunity to separate from the stock.
The former is achieved mostly by picking of flocks, the latter is achieved by leading the flocks over a grid.
- Using Inclined spiked lattice for opening cotton in the initial stages is always a better way of opening the cotton with minimum damages. Ofcourse the production is less with such type of machines. But one should bear in mind that if material is recycled more in the lattice, neps may increase.
- Traditional methods use more number of machines to open and clean natural fibres.
- Mechanical action on fibres causes some deterioration on yarn quality, particularly in terms of neps. Moreover it is true that the staple length of cotton can be significantly shortened .
- Intensive opening in the initial machines like Bale breaker and blending machines means that shorter overall cleaning lines are adequate.
- In a beating operation, the flocks are subjected to a sudden strong blow. The inertia of the impurities accelerated to a high speed, is substantially greater than that of the opened flocks due to the low air

resistance

of the impurities. The latter are hurled against the grid and because of their small size, pass between the grid bars into the waste box, while the flocks continue around the periphery of the rotating beater.

- By using a much shorter machine sequence, fibres with better elastic properties and improved spinnability can be produced.
- Air streams are often used in the latest machine sequence, to separate fibres from trash particles by buoyancy differences rather than beating the material against a series of grid bars.
- There are three types of feeding apparatus in the blowroom opening machines
 1. two feed rollers(clamped)
 2. feed roller and a feed table
 3. a feed roller and pedals

- Two feed roller arrangements gives the best forwarding motion, but unfortunately results in greatest clamping distance between the cylinders and the beating element
- feed roller and pedal arrangement gives secure clamping throughout the width and a small clamping distance, which is very critical for an opening machine
- In a feed roller and table arrangement, the clamping distance can be made very small. This gives intensive opening, but clamping over the whole width is poor, because the roller presses only on the highest points of the web. Thin places in the web can be dragged out of the web as a clump by the beaters
- Honeydew(sugar) or stickiness in cotton affect the process very badly. Because of that production and quality is affected. Particles stick to metal surfaces, and it gets aggravated with heat and pressure. These deposits change the surface characteristics which directly affects the quality and running behavior.
- There are chemicals which can be sprayed to split up the sugar drops to achieve better distribution. But this system should use water solutions which is not recommended due to various reasons.
- It is better to control the climate inside the department when sticky cotton is used. Low temperature (around 22 degree celcius) and low humidity (45% RH). This requires an expensive air conditioning set up.
- The easiest way to process sticky cotton is to mix with good cotton and to process through two blending machines with 6 and 8 doublings and to install machines which will segregate a heavier particles by buoyancy differences.

- General factors which affect the degree of opening , cleaning and fibre loss are,
 1. thickness of the feed web
 2. density of the feed web
 3. fibre coherence
 4. fibre alignment
 5. size of the flocks in the feed (flock size may be same but density is different)
 6. the type of opening device
 7. speed of the opening device
 8. degree of penetration
 9. type of feed (loose or clamped)
 10. distance between feed and opening device
 11. type of opening device
 12. type of clothing
 13. point density of clothing
 14. arrangement of pins, needles, teeth
 15. speeds of the opening devices
 16. throughput speed of material
 17. type of grid bars
 18. area of the grid surface
 19. grid settings
 20. airflow through the grid
 21. condition of pre-opening
 22. quantity of material processed,
 23. position of the machine in the machine sequence
 24. feeding quantity variation to the beater
 25. ambient R.H.%

26. ambient teperature

- Cotton contains very little dust before ginning. Dust is therefore caused by working of the material on the machine. New dust is being created through shattering of impurities and smashing and rubbing of fibres. However removal of dust is not simple. Dust particles are very light and therefore float with the cotton in the transport stream. Furthermore the particles adhere quite strongly to the fibres. If they are to be eliminated they are to be rubbed off. The main elimination points for adhering dust therefore, are those points in the process at which high fibre/metal friction or high fibre/fibre friction is produced.
- Removal of finest particles of contaminants and fibre fragments can be accomplished by releasing the dust into the air, like by turning the material over, and then removing the dust-contaminated air. Release of dust into the air occurs wherever the raw material is rolled, beaten or thrown about. Accordingly the air at such positions is sucked away. Perforated drums, stationary perforated drums, , stationary combs etc.
are some instruments used to remove dust