

Good Spinning Mill Maintenance: Key to the Success

Source: Textile Review

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Generally breakdown of the machines due various reasons is most common occurrence in the all types of industries. Even then people are not known or familiar to the good maintenance practices.

Maintenance of any machine can be categorized into two types. a) Preventive maintenance
b) Breakdown maintenance

The relation between both the above mentioned types is just like that of cricket match- like "Take the catches, win the matches" i.e. "Do proper preventive maintenance, and reduce idle time due to breakdown maintenance". Breakdown % of any mechanical spare part cannot be practically 0%. There are some of the reasons like, chocking or jamming of machine components, damage to bearing at running, break up of gear tooth reasons can cause the machine etc become idle due to break down. Also the standard norms have optimized maximum 0.5% stoppages for maintenance and maximum inventory stock % up to 20%.

In concern to the spinning mills, as a specific industry, higher breakdown maintenance has large share in manufacturing cost of product i.e. yarn. The author has written to this paper to make the people aware, the importance of preventive maintenance. The 25000 spindles spinning plant has considered for the write-up.

1) Blowroom

The very first simplest and most important practice in blowroom and carding is pneumatic cleaning of machines. Daily the blowroom is needed to be stopped for '12 hr. in the day shift and by opening the covers and doors; a high velocity compressed air is blown into the machines, mostly the waste zones and delivery zones like -

- In bale opener/ plucker - take up zone, fan zone, and ducts
- In mild opener - inlet zone, outlet zone and grid bar sections.
- In mixing machine - all cages for compartments, photocell regions, inlet zone, beater and grid bar zone, outlet zone.
- In fine cleaner - feed zone, beating zone, spikes of beater, photocell regions.

For good preventive maintenance, proper planning is needed, one of the plan optimized in the industry is as follows.

Daily AirCleaning	Half hr. per day
Weekly exhausted checking, repair and cleaning	Twice in a month (5 hrs. each)

2) Carding

It is the sequence of machines after blow room, which cleans the cotton to remove neps and seed coats. Licker in region will remove seed coats and heavy impurities, flats and

cylinder zone removes the neps. Firstly, carding wire mounting and grinding schedules must followed as per norms given below.

Maintenance Activity	Frequency
General Cleaning of Card	15 Days
Blow Room General Cleaning	15 Days
Doffer Hand Stripping	Every Day
Cylinder and Doffer Wire Replacement	700-800 Tons
Licker-in Wire Replacement	125 to 150 Tons
Flat Tops Replacement	350 to 400 Tons
Front Stationery Flat	125 to 150 Tons
Back Stationery Flat	125 to 150 Tons
Cleaning Fillet	1 Year
Licker-in Segment	150 to 200 Tons

Apart from these, daily pneumatic cleaning of machine, doffer stripping by hand stripping brush per shift is must, otherwise wires will be loaded with impurities, dust and affect the carding action. Feed zone and carding delivery zone is also most important. The schedule chart is given below.

Maintenance Activity	Frequency
Flat Grinding and Flat Chain Oiling	4 Months
Resetting of Card and Licker-in Wire Resharpening	4 Months
Gear Box Oil Change (Flat, Coiler and Side Shaft)	3 Months
Coiler Overhauling	8 Months
Web Doffing Cleaning and Greasing	3 Months
Main Motor Clutch Pulley Greasing	3 Months
Side Shaft Gear Box Cleaning and Bearing checking	6 Months

3) Draw Frame

The major areas of maintenance to be carried in drawframe machines are time to time oil change of the gear box, greasing activity of bearings at various drives in machine, setting points, calibrations etc.

Maintenance Activity	Frequency
General Cleaning and Greasing	11 Days
Bottom Plate Cleaning and Greasing	1 Month
Can Changer Assembly cleaning And Greasing	1 Month
Pneumatic Connection and Roll Membrane Checking	1 Month
Bottom Roller Gauge checking	1 Month
Top Roller Buffing and Greasing	1 Month
All belt Cleaning and tension checking	During Cleaning
All stop motion checking	During Cleaning
Flat Belt and Timer belt cleaning and checking	During Cleaning
Creel cleaning, checking and greasing	During Cleaning
RSB: scanning roller gauge checking	During Cleaning

Maintenance Activity	Frequency
Bottom Roller Bearing Cleaning and Greasing	3 Months
Gear box oil change and Coiler cleaning and greasing	3 Months
Scanning roller gauge checking	6 Months
Bottom roller bearing cleaning greasing	3 Months

4) Combining preparatory and combing machines

Important areas in combing preparatory and comber are drafting zone, combing zone, lap formation zone, delivery zone and waste extraction zone.

Maintenance Activity	Frequency
Full Cleaning and greasing	11 Days
a. Greasing of all bearing, needle bearing	During Cleaning
b. Greasing of top detaching roll, draw box roll bush and needle bearing	During Cleaning
c. Checking of oil level in Gearbox	During Cleaning
d. Coiler Assembly cleaning and greasing	During Cleaning
e. Brush shaft bearing checking and greasing	During Cleaning
f. Top detaching roller, Draw Box, Top roll cleaning	During Cleaning
g. Asperiator Cleaning	During Cleaning
Draw Box Gauge Checking	1 Month
Top Comb and unicom Comb Checking Noil suction wire mesh/ cage washing	During Cleaning
Noil suction wire mesh/cage washing	During Cleaning

Maintenance Activity	Frequency
Main Gearbox oil change	3 Months
Asperiator Brush setting	6 Months
Full Setting (All Points)	3 Months
Coiler Overhauling Cleaning and Greasing	6 Months
Detaching roller, draw box roller S.L.R.L., Top roller buffing	
Main gear box oil change	6 Months
Nipper setting	6 Months

5) Speed Frame

Important areas in Speed frame are creel zone, drafting zone, building zone- without increasing stretch on the material.

Maintenance Activity	Frequency
General cleaning, oiling and greasing	11 Days
a. Bottom roller needle bearing Greasing	During Cleaning
b. Bottom fluted needle cleaning with petrol	During Cleaning
c. To roller (cots) cleaning with C.T.C.	During Cleaning
d. Top and Bottom cone drum cleaning and belt setting full doff stop motion checking	During Cleaning
e. Greasing of	During Cleaning
I. Jack Shaft	During Cleaning
II. Lifter Shaft	During Cleaning
III. Bobbin and Spindle shaft	During Cleaning
IV. Bobbin rail lifting shaft	During Cleaning
f. Spindle and spindle collar oiling with CKS 600T Oil.	During Cleaning
g. Flyer Cleaning	During Cleaning

Maintenance Activity	Frequency
Creel Greasing	3 Months
Differential Gear Box oil Change	3 Months
Clutch cleaning and position checking	3 Months
Spindle collar cleaning and foot step oil change	3 Months
Top roller buffing	6 Months
Bottom roller setting and saddle gauge	6 Months
Top and bottom apron washing	3 Months
Flyer cleaning with graphite powder	6 Months
Roller Eccentricity checking	6 Months
Trough Lavelling	6 Months
Top roller arbour grasing	6 Months
Spindle and spindle collar truing	6 Months
Top roller greasing	6 Months

6) Ring Frame

Important zones are creel, drafting zone, winding zone and building zone.

Maintenance Activity	Frequency
General Cleaning head stock greasing, Traveler change	15 Days
1st Bottom roller needle bearing greasing	15 Days
2nd & 3rd bottom roller needle bearing greasing	1 Month
Front & back cots buffing	1 Month
Bottom apron centering	15 Days
Fan Cleaning	2 Months
New Bottom apron fitting	15 Months
New spindle tape fitting	2 Years
New Front / Back cots fitting	when under size

Maintenance Activity	Frequency
Variator Overhauling	3 Months
Suction tube washing	3 Months
Main shaft greasing	3 Months
Gear box load checking	3 Months
Additional drive and gearbox oil change	4 Months
Jockey Pulley Greasing	4 Months
Spindle Oiling	5 Months
Ring rail, lappet rail, height gauge	9 Months
2nd top roll greasing	6 Months
Top apron washing	6 Months
Head stock Overhauling	6 Months
Creel and U bar checking	9 Months
O.H.T.C. Overhauling and greasing	9 Months
Drafting checking	6 Months
Lappet joint collar checking	9 Months
Top arm centering	12 Months
Pneumatic connection checking	12 Months
Traveler clearer setting	12 Months

In mills always we see a lack of team work between various departments like production, quality control, maintenance, electrical engineering etc. Each department tries to throw off the responsibility of breakdown onto the other department. But success of any mill is synchronized module of all above said departments.

Good record keeping and timely done preventive maintenance as per schedule planed is key for success for a maintenance manager. Records like machine history book, indent book, stock register for spares (department wise), preventive maintenance report book etc. If maintained regularly and properly, will produce a transparent structure of spinning mill maintenance. Planning and scheduling can be done by standardizing the frequencies of jobs for the maintenance team with allotting proper labour compliment as per the norms. A technical personnel working in spinning mills maintenance, (he/she) must be aware of basics of drives and belts, lubricants, safety aspects, oils and gaskets, compressed air, bearings, tools and equipment. This will help them at the time of indenting the material from stores. Usually it is found that even though the maintenance manager is technical, the requisitions are given for the items on the basis of "As per sample attached". But this is the wrong practice followed which can be lead to wrong supply of the spares. Therefore the correct way to be followed is-

- For requisition of gears mention pitch, inner diameter, outer diameter,
- For requisition of bearing / oil seals mention inner diameter, outer diameter, width and thickness
- For requisition of screws and bolts mention type i.e. full thread or half thread and pitch of threads etc.

Nowadays, in the world of spinning with modern art of machineries, facilities are availed on machine itself for on line quality monitoring. Utilization of on line and off line quality

check up in synchronized manner by Q.C. department and maintenance department will definitely lead the spinners towards grand success.

Originally Published in Textile Review, Jan-2011

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