

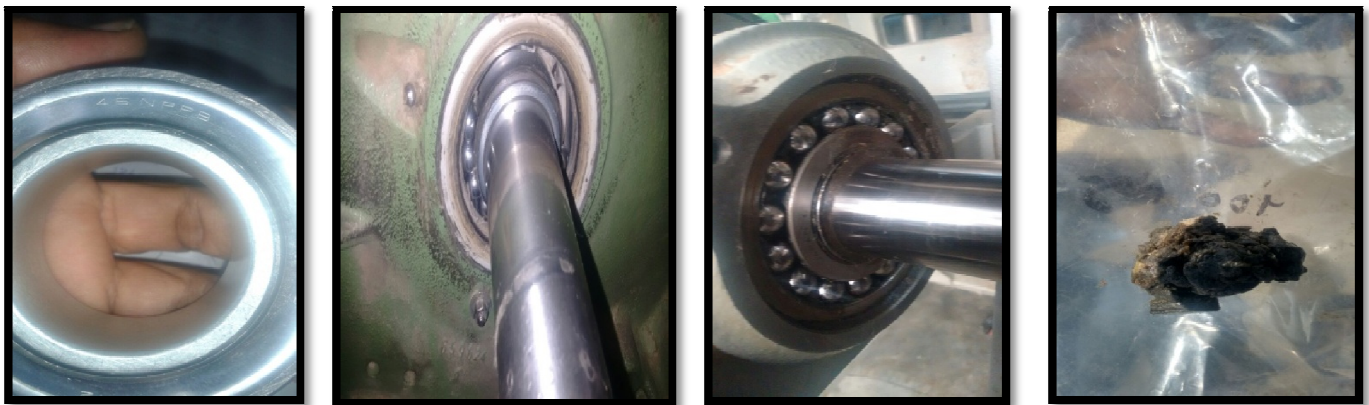
## TEXTILE MILLS can SAVE UP TO 6 % ENERGY SAVINGS now in their RING FRAME TIN ROLLER BEARINGS.

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Normally we come across in any industry equipment, the motor is coupled to the machine by way of belt, couplings and this coupling involves couple of bearings usually. But here, the ring frame needs 40 to 50 bearings set at tin roller to transmit power from motor to load. Here, the ring frame is a unique machine where the motor power is transmitted first to the tin roller by belt/ linkage and from the tin roller; **the power is distributed by tin roller to thousands of spindles. On any power distribution net work, the universal law is that in any T & D losses, Distribution losses are in few multiples of Transmission losses.**

### WHAT IS THE SAVINGS % IN THE MILL ELECTRICITY CONSUMPTION?

The ring frames in the ring frame consume around half the mill's monthly electricity bill that is the empirical thumb rule for any textile spinning mill, now. If we save around 6 % on the existing running frames, this works out to 3 % saving in mill's monthly **EB bill at no cost except spending on Specialty grease**. This can be tried by zero to low cost measures to achieve the savings in ring frames. This will give scope for savings & motor loading and in turn can be used to improve the ring frame productivity.



45 NPPB Tin roller Bearing / Tin Roller Bearings seen after removing grease hard cake / Grease Hard cake (see Hand below!!)  
Result of Repeated pumping in Re-greasing of MP3 grease / Images & Inputs – Courtesy: Salona Cotspin Ltd, Coimbatore.

### HOW THIS ENERGY SAVINGS CAN BE ACHIEVED NOW IN RING FRAME?

1. Mills record frequently, the relative condition KWH monitoring of ring frames for the same count, shows > 10 % variation.
2. One of major reasons for excess consumption in a frame is that the tin roller bearings in total, consume too excess power.
3. Actually tin roller bearing is the starting point of power distribution to each batch of 24 spindles x 50 no in 1200 spindles.
4. But the grease in the tin roller bearing after few months gets dried as hard cake and consumes more power by itself.
5. **The tin roller system consumes power around 12 % of ring frame first, and then only allows the power to spindles.**
6. The root cause of the problem is that tin roller bearing comes to our mill, with the factory sealed Multi Purpose grease?
7. Further to it, we had re-greased the same Multi Purpose grease once in six months, pumped in more, all these years.
8. But we had not removed the old grease from its drain plug, whether the new grease was IN and the old grease was OUT?
9. Over period of years, the grease supply tubing got choked and the bearing's grease dried out since new grease was not IN.
10. **Procure Polyurea based Lithium grease, like brands Mobil PolyrexEM, SKF LGHP2, ONWO Polytek grease @ Rs.800/ Kg.**
11. The specialty of this grease to this app, Shear stress stability, longer grease consistency and Extended Re-greasing interval.
12. Of the ring frames, which one takes more KW in your log book, take planned shutdown of the same for one 8 hour shift.
13. Two days before the planned shutdown, record the cumulative KWH of the frame along with basic & power parameters.
14. Measure the KW of machine with empty doff, remove the motor belt and measure the hot motor no load KW without belt.
15. Re-grease all the tin roller bearings, replace if needed only, with spare bearings enriched with above type specialty grease.
16. **Also remove motor bearings DE & NDE, clean the same, re-grease with specialty grease best suited to Electric Motors.**
17. Check and take image of bearings with hard lumps of grease cake sticking on, and this is due to oil in grease dried out early
18. **Not only, in tin roller bearings, but also in all higher HP motor bearings, this Specialty grease to apply Today & Now.**
19. **Motor Manufacturer BALDOR puts this grease** on his motor & gives longer re-greasing interval under severe conditions.
20. When this suits hot motor bearing for better shear resistance and grease consistency, this will suit well for tin roller' too.
21. Remove the grease supply tubings, clear the choke and see to it the new grease frees flowly thro the grease input tubings.
22. Now during restart of machine, measure again the motor no load KW, empty Doff and confirm the difference.

23. Record the KWH readings for two days after and confirm the improvements i.e. less DOFF hours, less KWH for Doff cycles.
24. Now we have to repeat this exercise during machine OFF condition after everyone year only and sustain the above savings.
25. If the bearing greasing is in good condition, check for the need of for online re-greasing every 6 months, if required only.
26. **Zero cost working is replacing with Specialty grease only in ring frame one by one, only grease to be purchased now.**
27. So, first procure one set of tin roller bearings, Check with the OEM; what is their factory sealed grease type and content?
28. Having removed the bearings from the frame, after cleaning etc, keep out, some of the totally worned-out bearings.
29. Whatever bearings retrieved from the machine, pls refill with specialty grease and keep this as active spare to put in next.
30. **Very Low cost to buy one tin roller bearings set to start in one frame first, and swap the removed, Cleaned, serviced and re-greased bearing from the first machine to the next frame, one by one. This is practically convenient to implement. One bearing set to buy now for mill to start with & replacement is convenient, comfortably can be completed in a shift.**

### WHY THIS ENERGY LOSSES HAPPENING IN RING FRAME ALL THESE YEARS?

Capacity utilization is self imposed rigorous unhealthy parameter & workings followed by mills. So the machines, especially the ring frame is running almost the full 24 hours a day. The machine is not given comfortable rest so as to take up preventive maintenance schedules. So on-line & in-situ lubrication of bearings is done religiously and worker pumps extra amount of grease on tin roller bearing sets. **Invariably in 8 out of 10 mills, after the greasing exercise done on a frame, the machine trips during the start due to over greasing during re-starting. So after few kick starts to the machine, this ring frame limps to normal!**

### WHY THE MILL HAS TO CORRECT ENERGY LOSSES NOW AND ONLY NOW?

Prevailing crisis in the mill is that the mill is starving to run due to hiked raw material costing by over 30 %. This is one of the ways, that the mill can reduce the power cost by adopting lean manufacturing practices. On the off days, the maintenance to take over the critical power consuming areas in the machines' running phase and give the timely first-aid type comfort to the aged machines. To plan for one shift Off to each ring frame to implement this bearing greasing exercise to that ring frame.

The present condition is that power cost is eating directly the OPM, the operating Profit Margin of the mill. For example in a textile mill running, instead of running 10 frames daily at 16000 rpm as spindle speed, give Rest to one frame daily and operate 9 out of 10 frames at 18000 rpm. The tenth frame can be taken for overhauling for the day & night maintenance work schedule. This gives compulsory rest once in 10 days or two weeks and the same exercise has to be repeated to other frames.

Energy Consumption in Ring frame	
Component	Power Consumption (% of Total)
Spindle driving power	39.3
Spinning power	19.7
Tin roller/pulley shaft	12.3
Package	8.8
Drafting	6.6
Empty bobbin	4.9
Motor	8.4
<b>Total</b>	<b>100.0</b>

Type of Service	Typical Examples	HP Range	Lubrication Interval (Yrs.)	
			Horizontal	Vertical
Easy	Valves, door openers, portable floor sanders, motor operating infrequently (one hour per day)	1 - 7.5	10	9
		10 - 40	7	3
		50 - 150	4	1.5
		200 - 350	3	9 months
Standard	Machine tools, air-conditioning apparatus, conveyors (one or two shafts), garage compressors, refrigeration machinery, laundry machinery, oil well pumps, water pumps, woodworking machinery	400 - 1000	1	---
		1 - 7.5	7	3
		10 - 40	4	1
		50 - 150	1.5	6 months
Severe	Motor for fans, MG- sets, etc., that run 24 hours per day, 365 days per year; coal and mining machinery; motors subject to severe vibration; steel mill machinery	200 - 350	1	3 months
		400 - 1000	6 months	---
		1 - 7.5	4	1.5
		10 - 40	1.5	6 months
Very Severe	Dirty, vibrating applications; where end of shaft is hot (pumps and fans); high ambient temperature	50 - 150	9 months	3 months
		200 - 350	6 months	1.5 months
		400 - 1000	3 months	---
		1 - 7.5	9 months	6 months
		10 - 40	4 months	3 months
		50 - 150	4 months	2 months
		200 - 350	3 months	1 month
		400 - 1000	2 months	---

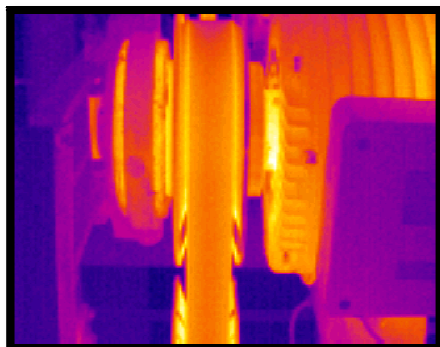
Energy consumption of ring frame, Courtesy :- SITRA study. / Lubrication Guide – Courtesy:- Excerpt from GEK-72836E.

### HOW THIS LOSSES CAN BE PREVENTED FROM NOW ONWARDS?

The mill has silently ignored the tin roller bearing greasing since many years. The mill has made up its mind to replace the tin roller bearings once in eight years. But till the eighth year, has the mill taken out the tin roller bearings to overhaul the same and put back in its position? When the mill maintenance wants to take up the overhaul of ring frame, the Management postpones the same conveniently citing the market demand situations. On every re-greasing of this specialty grease every year, pls see to it that old grease is oozed out of the drain cup and that confirms the new grease has taken the old grease position. This grease offers mechanical shear stability, stiffer grease consistency, and rust inhibition and deposit control and delivers exceptional protection even under the most demanding conditions, such as high temperatures and high speeds. **This already suited to ring frame motor bearings which face tangential shear stress. So the same can be applied to tin roller bearings.**

### CONDITION MONITORING THE RING FRAME ENERGY PARAMETERS?

8 out of 10 (ratio) mills of Indian Textpreneurs Forum, Coimbatore in their 25,000 spindle mill segment, have already procured the thermal imager recently. We understand each mill is innovatively using it fully to find the hotspots in each machine due to friction, mis-alignment in the all machine sub systems. Once thought that, the thermal imager is only to spot the electrical loose joint etc hotspots, these mills are wisely engaging the thermal imager daily to continuously find newer hotspots and take immediate steps the next day to reduce the hotspots intensity. The same thing to be followed in tin roller bearings set in each frame. Relative condition monitoring of hotspots across the bearings set in a frame will yield more inputs to arrest hotspots.



**Motor OEM BALDOR gives longer time interval for re-greasing with Polyurea grease / MP 3 grease Dried on motor Bearings.**

### **HOW THE OEMS CAN SUPPORT THE TEXTILE MILL TO REDUCE THE MILL RUNNING LOSSES?**

The ring frame machine OEM, Tin roller bearing, motor, belt, grease OEMs have to adapt themselves to latest condition monitoring techniques by the above prediction monitoring mechanisms, using thermal imager, vibration by SPM etc. Then they have to knowledge transfer, on the job train the user so as to reduce the daily running power losses in their equipments in mills. Let the tin roller bearing OEM suggest the grease what they are putting in, re-greasing interval, possibility of putting the Polyurea based specialty grease to their bearings in such a way, that re-greasing interval can be extended for an year instead of 3 / 6 month on-line re-greasing interval now; and that bearing can be removed, cleaned & re-greased with specialty grease.

### **GENERAL GUIDELINES TO BE FOLLOWED IN THE MILLS:-**

1. The lubrication of bearings and the machine internals yield both tangible and intangible results. Tangible in the sense, the power consumption comes down gradually and visual symptoms are that the localized hot spots gradually disappear by the right quality of lubrication in right time. The intangible benefit is that the machine sustains its rated efficiency when operated at its best operating point and working at its comfort level even after decade of severe usage.
2. Our Spinning mill is an alignment oriented industry. Many of our loads are tangentially coupled to motors. The production comes down due to misalignment inside machines. Lubrication to a machine comforts the machine to tolerate the effects of by poor alignment, friction etc. so as to make the machine running smooth.
3. This lubrication by way of grease, oil etc starts from motor end bearings, to the transmission gears to the load side. So to start with, the power of 55 KW at 1500 rpm is first applied to drive end bearing only, of the motor and then gets transmitted to load. So even a thermal imager can point out the deviation by more than 10°C diff from DE to NDE bearing.
4. Now, We are using the standard Multipurpose grease which is the universal application of all the industries for motor bearings, and some mills are pumping more grease every 3 to 6 months in each motor bearing and thus increasing power consumption and employing more man-hours for re-lubrication per year + excess grease inventory.
5. Many mills confirm that the heat on their motor skins have reduced by 20°C & more from changing over conventional grease to this specialty greasing. For normal healthy running of motors, the ambient + 20 \* C is the allowable skin temperature and above which, when the motor skin temperature rises, it indicates more losses in that motor running.
6. In a motor, considering the extrapolated distribution of failure of a motor component study, **the bearing malfunction / failure is 70 % of the causes on an average. Hence greasing & condition monitoring to machines has become critical.**

**This step, Please take TODAY, to reduce the power loss due to wrong grease.** On the whole, Let us ask ourselves why should we allow excess consumption of 6 % due to poorly lubricated incorrect greasing in the tin rollers, over many years? With one set of spare bearings to start with, the mill will be shocked to see the power loss of say 6 % all these say, eight years, had happened silently till yesterday and ignored by them un-knowingly. Today after implementing this exercise of removing the hard cake in bearing, the mill finds Relief now. **Tomorrow it will be a Delight to the mill that mill has reduced the energy losses by overhauling tin roller bearings only within the mill premises, improved their motor loadings, reduced the friction losses from tin roller thro spindle tape to the spindles, and the ring frame optimized UKG at higher spindle speeds now. Wrong grease losses do happen in Simplex with many bearings, Carding M/c etc, gone un-noticed till date. Please ACT now.**

**For more Energy Saving Tips & Details, Please visit the website [www.energymeasuretosave.com](http://www.energymeasuretosave.com)**