MicroPoly
The solid idea for lubrication

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MicroPoly® Lubricants
Environmentally Friendly Lubrication Products

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Introduction

MicroPoly is a solid lubricant which is comprised of two major components, a hard sponge-like polymer containing a continuous micro-porous network, and oil contained within the pores. The oil migrates by capillary action to MicroPoly's surface and provides lubrication by transferring the oil to the surface that comes in contact with the MicroPoly. The application of MicroPoly to lubricate ball and roller bearings has been described in detail [1, 2]. In these applications, the bearings are filled with MicroPoly and do not require re-lubrication, and therefore, reduce maintenance costs. Since MicroPoly also acts as a sponge, the oil is reabsorbed and prevents dripping. This property of MicroPoly improves housekeeping, plant safety and reduces environmental contamination. This article will quantify the benefits of MicroPoly compared to grease in reducing this environmental impact: MicroPoly is "Green".

Results and Discussion

MicroPoly filled bearings do not require maintenance during the life of the bearing. They never have to be refilled. Greased bearings, on the other hand, require regular maintenance including re-greasing. The recommended re-greasing frequency depends on type and size of the bearing. Using the re-greasing amounts and schedules recommended by the bearing manufacturers, the total amount of grease used in each bearing per year can be calculated and compared to the amount of oil in MicroPoly. These calculations were made for three different sizes for single row ball, spherical roller, and taper roller bearings. (Note: adjustment of the re-greasing interval is required depending on the RPM and temperature experienced by the bearing. The calculations were made assuming a temperature between 20 and 80°C and standard rotational speeds.) The results are shown in Table 1.

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Table 1: Estimated grease used each year compared to the oil in MicroPoly.

Bearing Type Number	Bearing Dimensions (mm) Bore	Width	O. D.	Grease * in Bearing (gm)	Relube ** Interval (hr)	Grease Used per Year (gm)	MicroPoly in Bearing (gm)	Oil in MicroPoly (gm)	Difference Grease - Oil in MicroPoly (gm)
Single Row Ball									
6205	25.0	15.0	53.0	3.5	1100.0	27.9	3.8	2.1	25.8
6208	40.0	18.0	80.0	6.3	1100.0	50.5	9.5	5.2	45.2
6213	65.0	23.0	120.0	12.1	1100.0	96.7	30.4	16.7	80.0
Spherical Roller									
22205	25.0	18.0	52.0	4.1	110.0	328.0	4.8	2.6	325.4
22310	50.0	40.0	110.0	19.4	110.0	1541.8	8.5	4.7	1537.1
23220	100.0	60.3	180.0	47.8	110.0	3803.2	112.0	61.6	3741.6
Taper Roller									
2729/2776	38.1	23.8	76.2	8.0	110.0	635.5	9.8	5.4	630.1
394/395	63.5	22.0	110.0	10.6	110.0	848.0	18.0	9.9	838.1
74850/74550	139.7	47.6	216.0	45.2	110.0	3602.7	119.5	65.7	3536.9

* Grease required (gm) is calculated using the following equation based on a SKF formula discussed in a Noria Article [3].
Weight of Grease (gm) = 0.0044 times OD (mm) times width (mm).

** Calculated re-lubrication interval (hr.) is calculated using information from SKF's Web Site [4].

As the last column in the table above shows, the amount of lubricant used per year per bearing is significantly less for MicroPoly lubricated bearings compared to greased bearings. As an example, in many processing lines, it is not unusual to have over 100 spherical bearings. Assuming that a 22310 spherical bearing is employed, the data above indicates that about 154000 grams or 340 pounds of grease will be used each year. This compares to about 1 pound of oil incorporated in MicroPoly for the same bearing. Therefore, a greased bearing has a much greater negative impact on our environment compared to a MicroPoly filled bearing, i.e., MicroPoly is more “green” friendly. It is also clear that greasing bearings results in greater maintenance costs compared to MicroPoly.

References

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