

# Gatco, Inc.

## Oil Lubrication Information for Gatco Rotary Bushings

Data Sheet 1009-2



### Oil Lubrication

Gatco rotary bushings must be properly lubricated to maintain a film of lubricant between the rolling element and the raceways of the bearing. Without this film the bearings will fail prematurely. The methods used to attain this film is by introducing oil lubrication or grease lubrication.

The simplest and most commonly used means of lubrication is to grease pack the bearings for life. Ninety percent of bearings will function adequately using this method. The advantage of this means of lubrication is that it eliminates re-greasing maintenance and the elimination of lubrication system failure. The disadvantage of grease is the limitations of speed and excluding contaminants.

Oil lubrication is recommended for many applications. The method of supply can be adapted to suit the operating conditions and machine design. Oil lubrication is a satisfactory means for lubricating rotary bushings operating at high speeds, as well as those subjected to heavy loads. An advantage of oil lubrication is that the bushing can be attached to the automatic oil lube system on the machine. Automatic lubrication systems dispense lubrication at timed intervals, eliminating the need for intervention by machine operators or by maintenance personnel to lubricate bushings. Operating speed can be increased substantially over grease lubrication. Gatco as a general rule recommends DTE Oil Light (or equivalent) although most oils used in automatic lube systems will suffice because the rotary bushing normally is not operating under severe conditions or extreme speeds.

Although at first appearance it may seem like incorporating an auto lube system is preferred, there are some disadvantages to these systems. Oil cleanliness is a must. The lubrication must be filtered. Also the air and oil must be carefully monitored for correct volume and pulses.

There are several methods available to introduce oil to the rotary bushing. Due to the variety and sophistication of automatic lubrication systems on the market, as well as advancements in lubrication technologies it is best to have the lubrication system supplier and the machine builder determine delivery requirements for the lubrication of the bushings.

### Lubrication Benefits

- Minimizes friction at points of contact within the bushing.
- Prevents Corrosion from forming within the bushing or Tool Holder.
- Aids in Dissipating Heat.
- Eliminates bearing and spindle wear.
- Controls temperature at high speeds.
- Forms a thin film between the rolling element and the bearing race which is capable of supporting load.
- Prevents Premature failure of the bearings.
- Dampens running noise.

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The most common lubrication systems for the machine tool industry are air and oil systems. These are total loss systems which use a minimal amount of air and oil. Lubricating variables can easily be changed by adjusting metering, velocity and cycle sequence. The air introduced in these systems offer an added advantage in that the air is under pressure and has a tendency to expel contaminants.

Gatco suggests that the customer refers to SKF Bearing Company lubrication website, for in-depth information regarding lubrication systems, oil recommendation and calculations.

Below we have provided a formula for a rough estimate on bushing oil lube requirements.

$$Q = \frac{q d B}{100} \quad \text{mm}^3 \quad \text{cm}^3 = \frac{Q}{1000} \quad \text{Litres} \quad L = \text{cm}^3 (.001)$$

Where:

Q = oil flow rate, mm<sup>3</sup>/h

d = bearing bore diameter, mm

B = bearing width, mm

q = factor

q = 1-2 for cylindrical roller bearings

q = 2-5 for angular contact ball and thrust ball bearings

q = 10-20 for angular contact ball bearings in high speed applications

(due to the pumping effect of the bearings)

General oil lubrication recommendation:

Air Pulse = 6-8 pulses per hour

Air Pressure = 0,5 – 1,5 bar

Air Filter = 5 micron