APPLICATION ENGINEERING NEWSLETTER

Pump Bearing Temperature

The maximum operating temperature for a ball bearing in a pump is the result of a number of factors, not limited to, but including some or all of the following:

1) Operating speed
2) Shaft loading
3) Type of lubrication
4) Amount of lubricant in the bearing
5) Pump alignment
6) Pumping temperature
7) Ambient temperature
8) Bearing fits
9) Continuous or on-off service
10) Location of the pump duty point on the performance curve
11) Type of pump (Example: 320 series vs. 610 series)

It is important to define where the bearing temperature is taken. The temperature at the bearing surface will be higher than at the outside surface of the bearing cap, possibly 10 to 15°F difference. For the following, we define temperature as that taken at the bearing cap surface.

It is Aurora Pump’s position that an operating temperature at the bearing cap not exceed 175°F, would not be excessive as long as the temperature has leveled out and not still rising. Above that point temperatures up to 200°F might still be satisfactory, but we would recommend further investigation to determine the cause of the higher bearing operating temperature.

In pumps for boiler feed applications handling hot water above boiling point and other high temperature applications, the bearing temperature may approach this higher limit from heat transfer along the shaft and still perform satisfactorily. Special consideration of lubricants, water-cooling or special bearing clearances may be required for pumping temperatures above 250°F on general-purpose bearings before heat treating for dimensional stability is recommended.

Over lubrication of bearings should be avoided as it may result in overheating and possible bearing failure. Under normal applications, adequate lubrication is assured if the amount of grease is maintained at 1/3 to ½ the capacity of the bearing and adjacent space surrounding it. We recommend using a premium lubricant equal to Chevron SRI Number 2 (polyurea base).