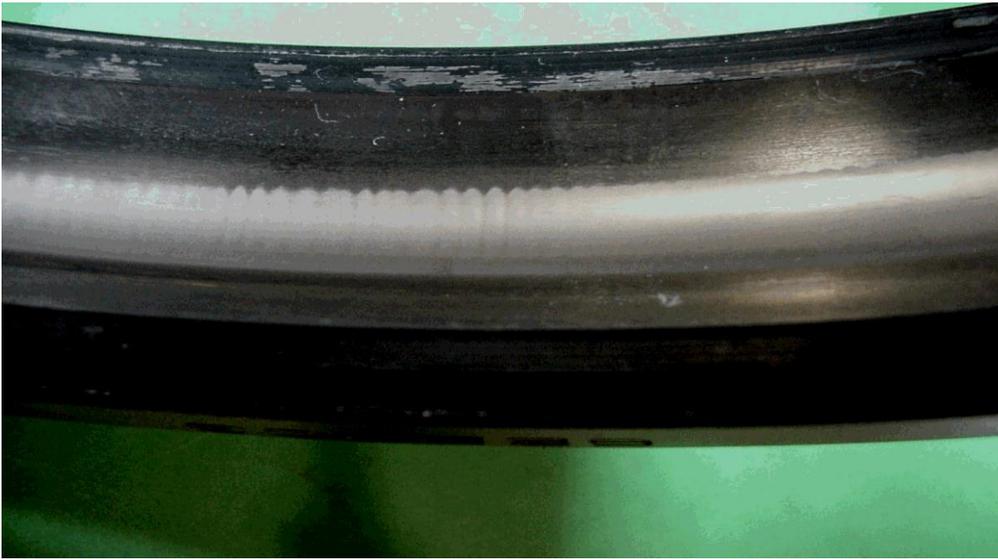




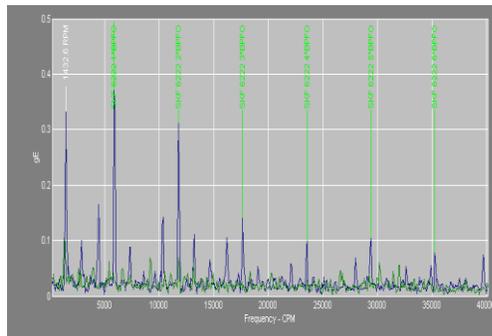
Electrical Fluting



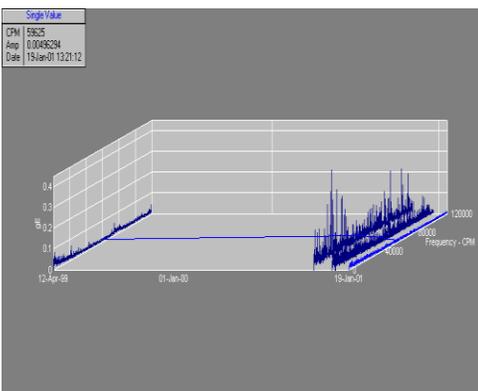
- Finding the bearing defect prevented unplanned downtime
- Noticing the electrical fluting save the other components from being damaged beyond repair thus saving money
- Saved many headaches

Detecting Electrical Fluting

The picture above shows the fluting characteristic with fine arc marks across the bearing outer race and the absence of spalling. Normally fluting of a bearing will not cause immediate failure, but has a side effect where the outer race defect could excite a natural frequency. For example when the outer race is stationary a portion of the outer race is in the load zone at all times. Balls and rollers passing over the load zone generate a discrete frequency. A discrete frequency excites a natural frequency only when the natural frequency is equal to the discrete frequency, a harmonic or a sub harmonic of the discrete frequency. This excited natural frequency can cause excessive vibration and component failure.



Above is a spectrum overlay showing the bearing defect frequency found on a 6222 motor bearing. The blue spectrum was taken on December 13, 2000; the green overlaid spectrum was taken on December 20, 2000 with a new motor. Notice there are no bearing outer race defects on the green spectrum. These defects were only found with the SKF enveloped Gs spectrum, and not on the standard velocity spectrums.



To the left is a palogram showing the spectrum in 1999 and then in 2000 with bearing defects and then with the new motor. The bearing was evaluated and was found to have electrical fluting. Typically electrical fluting is caused by incorrect welding on a drive system. Today most plants have procedures to insure proper welding techniques. Other conditions that can cause electrical fluting are: 1. High efficiency motors with close air gaps can cause increased eddy currents and fluting. 2. On DC drives fluting can be caused by SCR drive problems.

Predictive maintenance extends the life of machinery, and saves money.



Outer race bearing defect of gear A bearing found through vibration analysis

Any questions feel free to contact Larry Massey lmasey@ma.r.com