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Bearing failure or proper lubrication? The choice is yours.

Better lubrication practices could prevent the type of bearing damage that leads to costly premature motor failures in countless plants. How are you taking care of these crucial activities in your operations?

Proper lubrication of ball and roller bearings in electric motors is essential to their health. Grease reduces friction and protects the surface finish from rust during long idle periods and in unfavorable environmental conditions. It also transfers heat from the bearing and even helps protect the bearing from dirt and contaminants. Since bearing life—and, by extension, motor life—depends on proper lubrication, it's important to use the right grease for the application and to re-lubricate bearings at the correct intervals.

The basics

Grease is a "dirt magnet," so it's surprising to many that packing it into the cavity around the bearing actually helps keep dirt and other contaminants from getting into this critical component.

On very old motors, lubrication was provided by oil-soaked felt that "wicked" oil to the bearings. Grease serves this function in today's machines. Consisting of oil suspended in a base material like lithium, calcium or polyurea, it lubricates the bearing continuously while preventing the oil from leaching out. Depending on its composition, different greases may be better suited for one application than another. For example, one may be superior at high or low temperatures, another impervious to water, while still others retain oil better under extreme pressures.

The lesson here is to select the right grease for the application. An electric motor in an Arizona open-pit copper mine where the ambient temperature is 130 F requires different grease than an identical motor in the Arctic Circle.

Table I. NLGI Grease Compatibility Chart

B= Borderline Compatibility
C= Compatible
I= Incompatible

	Aluminum Complex	Barium	Calcuim	Calcium 12-hydroxy	Calcium Complex	Clay	Lithium	Lithium 12-hydroxy	Lithium Complex	Polyurea
Aluminum Complex	X	I	I	C	I	I	I	I	C	I
Barium	I	X	I	C	I	I	I	I	I	I
Calcuim	I	I	X	C	I	C	C	B	C	I
Calcium 12-hydroxy	C	C	C	X	B	C	C	C	C	I
Calcium Complex	I	I	I	B	X	I	I	C	I	C
Clay	I	I	C	C	I	X	I	I	I	I
Lithium	I	I	C	C	I	I	X	C	C	I
Lithium 12-hydroxy	I	I	B	C	I	I	C	C	X	I
Lithium Complex	C	I	C	C	C	I	C	C	X	I
Polyurea	I	I	I	I	C	I	I	I	I	X

[redacted]

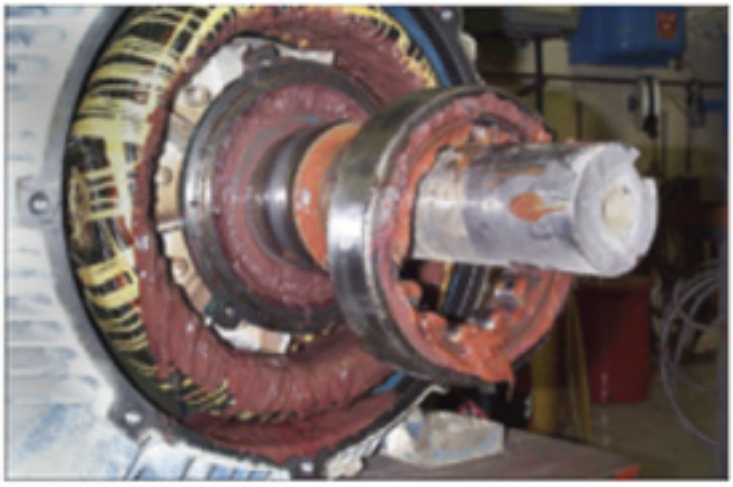

Fig. 1. Two incompatible greases may combine to form a soupy mix like this, or a near-solid mass. Either way, the lubricating characteristics are usually lost.

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Fig. 2. Pumping too much grease into a motor bearing could do more damage than insufficient lubrication. The excess has to go somewhere. If doesn't seep out around the shaft opening, it probably will end up on the motor windings, trapping dirt and heat that can lead to early winding failure.

Fig. 3. These battery-powered devices provide a regulated flow of fresh grease to each bearing.

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