

Bearing Isolators 101

Permanent Bearing Protection Offers Advantages

For more than 27 years, Inpro/Seal Bearing Isolators have been used to permanently protect bearings in many types of rotating equipment, including process pumps, electric motors from 1/2 to 10,000 hp, gearboxes and mechanical drive steam turbines. They can be obtained in solid and split configurations and made to accommodate shafts from 0.625-to 108 in. in diameter. Generally, they are made of bearing bronze, but other metals such as stainless steel, titanium and aluminum are commonly used.

BASICS

A bearing isolator is a noncontact, nonwearing, permanent bearing-protection device. It has a rotor and a stator, and the two are unitized, so that they don't separate from one another while in use. Typically, the rotor turns with a rotating shaft, while the stator is pressed into a bearing housing. The two components interact to keep contamination out of the bearing enclosure and the lubricant in. Bearing isolators do not require lubrication or any particular shaft finish or condition.

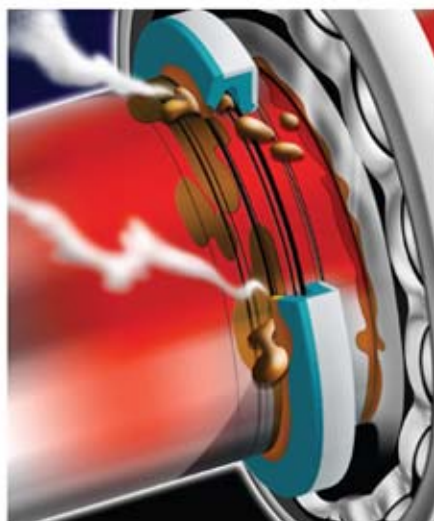
The best bearing isolators are made of metal, usually bronze, and they utilize a vapor-blocking feature that inhibits the free transfer of vapor contamination when the rotating equipment is cycled on and off.

The original bearing isolator was invented and patented in May of 1977 by David C. Orlowski, of what is now the Inpro/Seal Company (patent # 4,022,479). Even the term "bearing isolator" was invented at Inpro.

The first bearing isolators were applied to process pumps in the food and chemical processing industries. Next, they were applied to severe-duty TEFC industrial motors. Soon, bearing isolators were being used in all types of rotating equipment in heavy industry.

CONTACT SEALS

Before the introduction of bearing isolators, bearing protection for industrial and process equipment was generally limited to contact seals such as lip seals and face seals. A rubber lip seal, with a maximum useful life of 3,000 hours (4.1 months) was used to protect rolling element bearings with a design life rating exceeding 150,000 hours (17 years). As the lip seal condition deteriorated, it just grooved



the shaft or carbonized at the point of contact with the shaft, and it lost its ability to effectively seal the bearing enclosure. Lip seals are rarely replaced when they wear out.

Face seals, whether spring loaded or magnetically loaded, were found to have a finite life and were unpredictable as to the timing of their abrupt and certain failure. Due to the nature of their design, they are always taken out of service after failure and replaced, but not necessarily in kind.

Because of their temporary nature and unpredictability, contact seals proved to be woefully inadequate with regard to protecting heavy duty bearings in severe duty process equipment. As a result, rotating equipment in the process industries was quite unreliable, and catastrophic failures due to bearing degradation were commonplace.

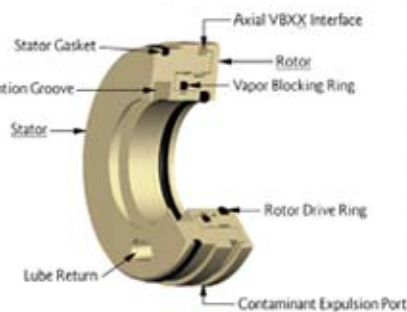
All types of contact seals, because of their nature, consume power and cause heating of the lubricant and even the bearings themselves. According to the manufacturers, the typical power consumption is approximately 150 watts per seal.

GOING FORWARD

Beginning in 1977, bearing isolators gradually

began to replace lip seals in industrial pumps in various process industries. One by one, they proved that they could be an economic alternative to what was once conventional contact sealing methods, because of their longevity and their ability to perform in an absolute manner with respect to complete and permanent bearing protection.

Because of customer demand, bearing isolators were first installed by the manufacturers of pumps and motors as standard optional features. They were then installed as standard equipment on top-of-the-line products. Pumps that used to cycle in and out of the maintenance shops now performed without attention for years instead of months. Motors that previously had little or no bearing protection as standard, now were able to survive in hostile environments, for five years or more. Manufacturers' warranties were adjusted to conform to field experience.



Bearing isolators generally cost five times as much as a common rubber lip seal, but the cost of installation is about the same. As rotating equipment is routinely maintained and repaired, the metal bearing isolators can be used over and

over for many years.

The Inpro/Seal Company is located in Rock Island, IL in an 84,000 sq. ft. facility. Seventeen computer driven turning centers and two automatic vertical milling machines help to ensure same-day shipments for Inpro's customers around the world.

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