

What^{the}HECK

is a bearing isolator?

A bearing isolator is a non-contact, non-wearing, 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.

The best bearing isolators are made of metal, usually bronze, and they utilize a vapor-blocking feature which 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 Orlowski.

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.

Before the introduction of bearing isolators, bearing protection equipment 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, 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 lost its ability to effectively seal the bearing enclosure. Lip seals were rarely replaced when they wore out.

Face seals, whether spring loaded or magnetically loaded, were found to have a finite life and unpredictable as to the timing of their abrupt failure. Due to the nature of their design, they were nearly 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 was 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.

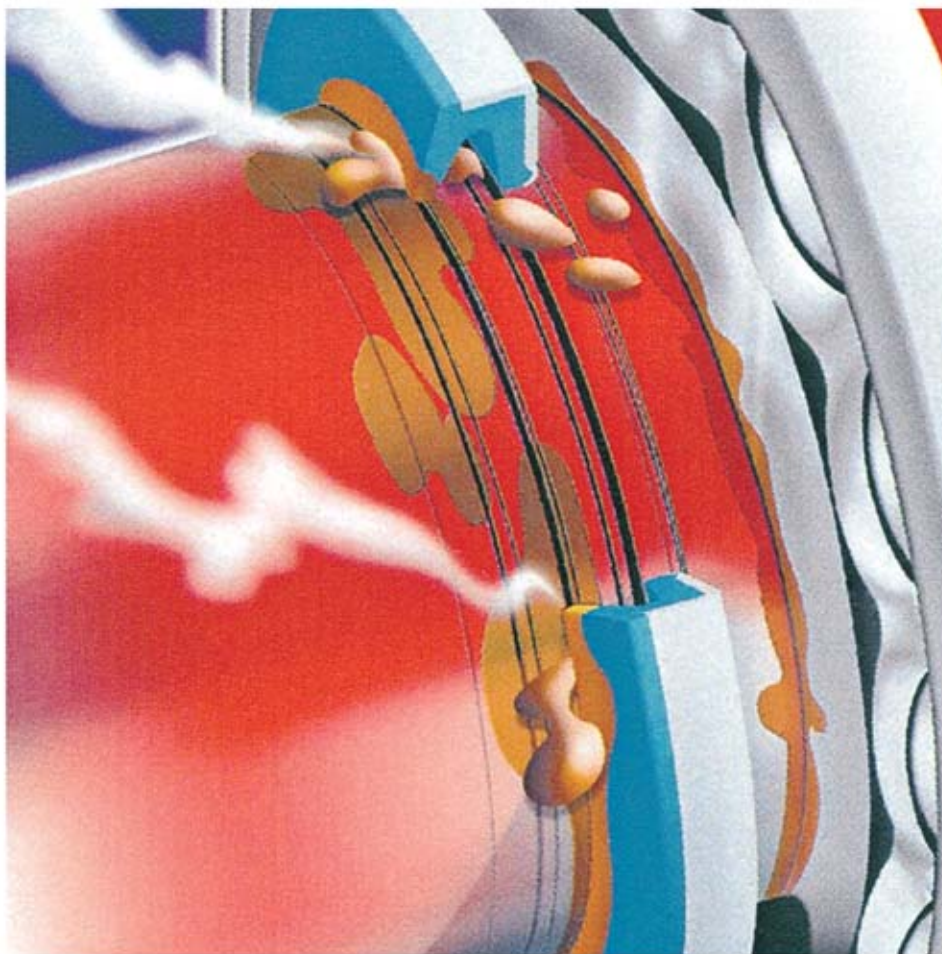
Bearing isolators gradually began to replace lip seals in industrial pumps in various process industries. One by one, they proved that they could be an economic alternative to what was once conventional contact sealing methods because of their longevity and ability to perform in an absolute manner with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

Because of customer demand, bearing isolators were first installed by the manufacturers of pumps and motors as standard optional features, and then 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 bearing isolators can be used over and over for many years.

David C. Orlowski is the author of over 40 patents, and has spent the last 40 years working to enhance and extend service life of rotating equipment.

For more information, contact INPRO/SEAL Company at 800-447-0524 or go to www.bearingisolators.com.



Lip seals burn and groove the shaft.