Subject: Pure Mist Application With Magnetic Face Seals Or Bearing Isolators

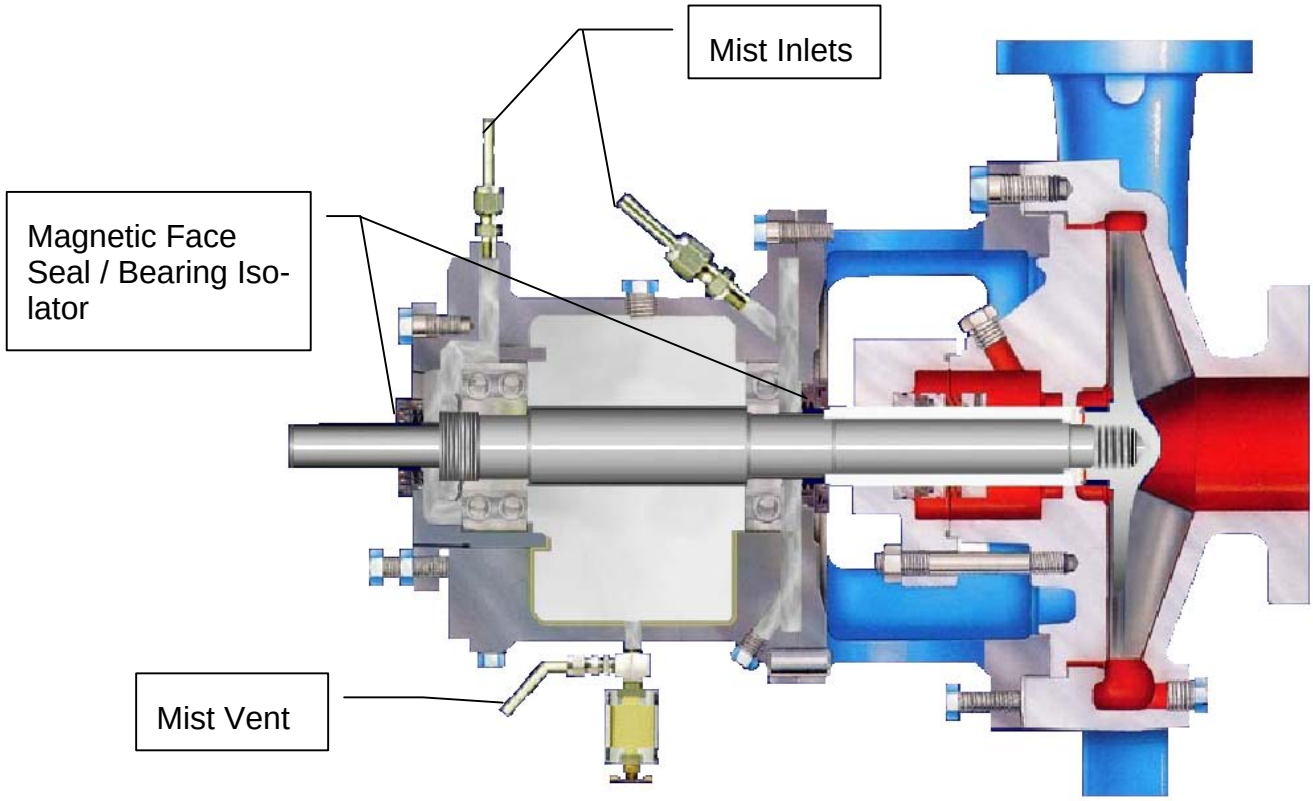
The use of contact type bearing housing seals is becoming increasingly popular with users of LubriMist® oil mist systems. Positive bearing housing seals are commonly described as magnetic face seals or bearing isolators. When installed, unlike labyrinth type seals, these devices provide a positive seal between the interior of a bearing housing and the outside environment. When installed in machinery bearing housings served by pure oil mist, these seals also keep oil mist from being vented to the atmosphere.

API Standard 610 – *Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries* (9th Edition) specifies that when oil mist lubrication is used, the mist inlets be arranged so that the oil mist flows through the bearing rolling elements (par 5.10.2.8). The standard practice to ensure compliance with this is to locate separate mist inlet connections between the thrust and radial bearings and their respective bearing end cap. The mist flows through the bearings and then towards the center of the pump. The mist vents to atmosphere through a common vent or vent / drain connection. Although not required, the use of magnetic face seals or bearing isolator seals in overhung centrifugal pumps is seen as an excellent method for optimizing the performance of oil mist lubrication technology. When LubriMist® Closed Loop oil mist systems are specified, magnetic face seals or bearing isolators are an integral part of the overall strategy for limiting the stray oil mist emission into the atmosphere.

We are seeing increasing numbers of magnetic face seals or bearing isolators being installed in older pumps and rotating machinery. In these older pumps, the existing bearing housing vent or oil fill connection located in the center of the bearing housing is typically used for the oil mist inlet connection. In this application the mist can pass through the bearing and vent through a labyrinth type seal. However when bearing housings are fitted with magnetic face seals or bearing isolators, the mist flow path is removed and positive mist flow through the bearing elements is compromised.

**CONNECTING SINGLE POINT MIST APPLICATIONS (CENTER INLETS) TO PUMPS EQUIPPED WITH MAGNETIC FACE SEALS OR BEARING ISOLATORS CAN LEAD TO THRUST BEARING FAILURE DUE TO INADEQUATE LUBRICATION.**

LSC Sales, Engineering and Service personnel must be aware of this potential problem. A primary qualifier for any pure mist application must include a review of the shaft seal arrangement. Don't depend on cross sectional drawings to show the actual shaft seal arrangement that is in the pump. These modifications are generally made during in plant equipment maintenance and repair operations**. ASK THE OWNER OF THE EQUIPMENT!**




When equipment is fitted with magnetic face seals or bearing isolators ensure that the mist inlet and vent connections are located on opposite sides of the lubricated bearing. This may require that customers make modifications to certain pieces of equipment. If a machinery item is found to have magnetic face seals or bearing isolators, and the customer is unwilling to make necessary modifications to ensure mist flow through the bearings, then the equipment should be connected as purge mist.

Additional information on magnetic bearing isolators is attached.

Charlie Ehlert

Charlie Ehlert
Dir. Quality Control and New Product Development
PQSC Chairman

# Dual-Face Magnetic Bearing Isolator for Sealing Bearings with Oil Mist Lubrication

**Background:** Oil-mist lubrication of rolling-element has been proven to greatly reduce the number of bearing-related equipment failures and the related cost of repairs. Although oil-mist has been available for over 30 years, recent developments in sealing technology have made oil-mist more efficient and more environmentally friendly.

Figure 1 shows a dual-face magnetic bearing isolator. This isolator uses modern mechanical seal face technology to totally seal the bearing housing. The seal shown is designed for oil-splash lubrication.

Figure 2 shows a dual-face magnetic bearing isolator that has been designed for oil-mist lubrication. The inboard face has been laser-etched to allow oil-mist to enter the isolator housing and lubricate the outboard face.

1. Tungsten Carbide Rotary
2. O-ring
3. Antimony Carbon Stationary
4. O-ring
5. Stainless Steel Housing
6. O-ring

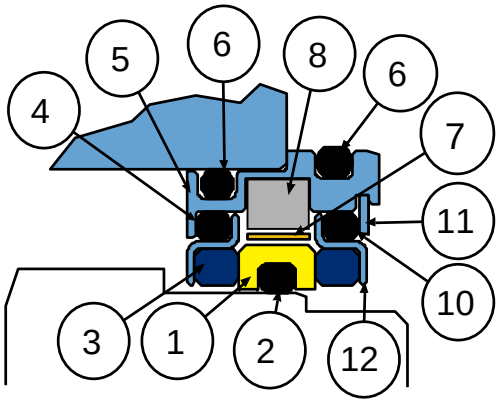



Figure 1

**Equipment Specification:**

Dual-Face Magnetic Bearing Isolator for

Oil Mist.

Rotary Face: Tungsten Carbide

Stationary Face: Antimony-Carbon

Magnets: Samarium Cobalt w/Nickel plating

Housing: 316 Stainless Steel

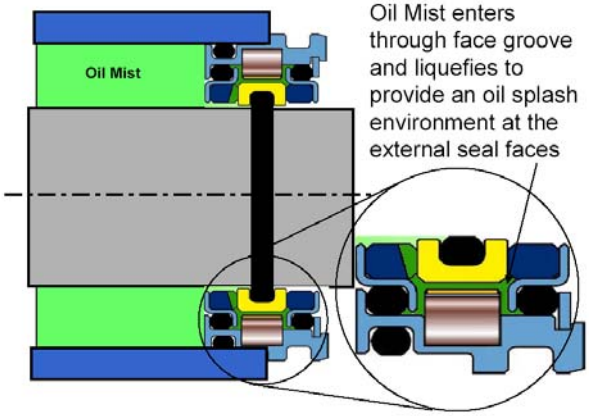



Figure 2

# Dual-Face Magnetic Bearing Isolators for Sealing Bearings with Oil Mist Lubrication

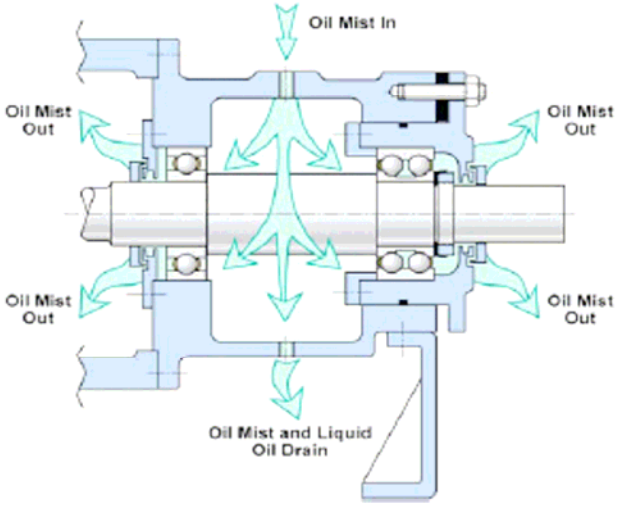



Figure 3. Old API 610 7th edition oil mist plan. Note mist leakage to atmosphere through labyrinth bearing isolators.

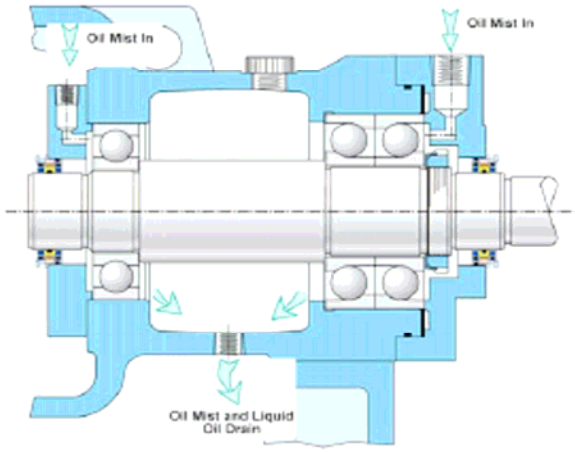



Figure 4. New API 610 8th edition oil mist plan. Note there is no leakage of oil mist to atmosphere. Labyrinth isolators have been replaced with magnetic face seals.

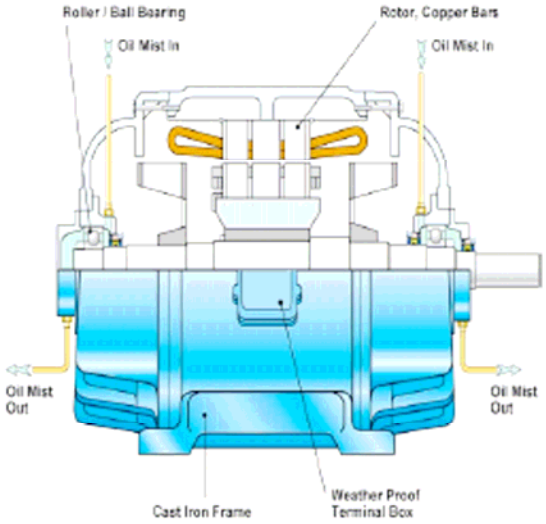



Figure 5. Oil mist application on an Electric Motor. Magnetic face seals prevent mist leakage to atmosphere and into motor windings.

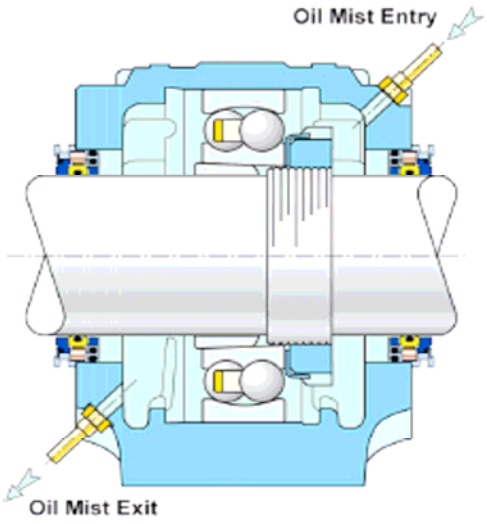



Figure 6. Magnetic face seals installed on a pillow-block bearing of the type that may be used on fin-fan shafts.