





Mechanical Seal Presentation April 22, 2009 Seattle WA.





ANSI Process Pump







Lift the shaft, or exert light pressure at the impeller end. If more than .003 of radial movement occurs, check bearing and bearing fits.



Install the dial indicator as shown.

Use a soft hammer or mallet to lightly tap the end of the shaft. Total Indicated Readout (TIR) should not exceed .002



Rotate the shaft, at the impeller end.

If more than .003 of radial movement occurs, check bearing and bearing fits. Also check for bent shaft.







INTRODUCTION TO MECHANICAL SEALS





NCE

- Point A Shaft Seal
- Point B Gland Seal
- Point C Rotary Face

Sealing Points

- Point D Stat. Face
- Point E Primary Seal

Creating a seal

- Three conditions absolutely must be met for the two faces to create a proper seal.
- **1)** They must both be extremely flat.
- 2) Held parallel to each other, keeping the faces in contact with each other at all times.
- **3)** Kept closed together by an external force such as springs.

Now that we have a **"static"** seal between the two faces, how do we make it a functional **"dynamic"** seal at 3600 rpm?

In order to create a functional dynamic seal, there must be a clean lubricating fluid present between the seal faces.

MECHANICAL SEALS ABSOLUTELY MUST HAVE A LIQUID LUBRICATING THE FACES!

Lubrication

The lubricant is an ultra-thin, hydrodynamic film of fluid filling the space between the two sealing faces The lubricating fluid is forced between the sealing faces by product pressure A combination of closing force and centrifugal force keep the product from completely crossing the seal faces Lubrication determines whether a single- or double-seal is required in an application:

Single-seals use product to lubricate the faces Double-seals use a barrier fluid to lubricate the faces

- Microscopic surface scratches produced during lapping provide a path for lubrication.
- The natural waviness of the seal faces created during fabrication provides a path for lubrication.
- Although the face is nearly perfectly flat, it is through these imperfections that the product is forced between the faces.

Outside Mounted Seal

- Rotary unit is installed
 OUTSIDE of the stuffing box.
- ✓ No metal parts come in contact with the product.
- ✓ Only low temp. and pressure.
- ✓ Factory pre-set spring load.
- ✓ Easy to install.
- Used in aquatic applications with shallow or no stuffing box.

- Utilizes one set of sealing faces.
- Product is used to lubricate the faces.
- Suitable for a broad range of applications.
- Can be either component or cartridge style.

Available with Non-metallic Adapter

- Creates flush port.
- ✓ For equipment with shallow or no stuffing box.
- Flushed or non-flushed.

As Fluid Enters the Seal Chamber, It Only Contacts:

- **1. PPS Sleeve**
- 2. PPS Insert
- 3. Silicon Carbide Face
- 4. Carbon Face
- 5. O-Rings

Available Controls

Many adverse environmental conditions can occur in a single application.

Controlling these adverse conditions becomes critical to extending the life of the seal.

The first step to sealing an adverse environment is selecting the proper style of seal.

The next step is setting up the seal with the proper environmental controls.

Flush

A clean fluid, external to the process, is introduced into the seal chamber, either through the seal gland or the chamber itself.

To ensure that the flush flow goes into the seal chamber (and not out), flush supply pressure must be greater than seal chamber pressure.

The product is diluted by the flush.

A throat bushing is typically used in the bottom of the chamber to minimize the flush flow rate.

Suction Bypass

A piped fluid connection between the seal chamber and the pump suction Net flow is out of the seal chamber and into the suction Reduces the pressure in the seal chamber Flow may be regulated, cooled, or heated as needed May be used with a throttle bushing

Suction Bypass

Discharge Bypass

Net flow is into the seal chamber and out of the discharge. Increases the pressure in the seal chamber. Flow may be regulated, cooled, or heated May be used with a throttle bushing

Discharge Bypass

Programs available to Aquatic users

- 1. Quantity Discounts
- 2. Exchange Programs
- 3. Fixed Price Repairs
- 4. Failure Analysis

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