English

FLOWSERVE

General Installation and Maintenance Instructions for Mechanical Seals

Table of Contents ***page no.***

1. Drawing, Brief Description, Explosion Protection, Functional Requirements 2
2. Safety 3
3. General 4
4. Transport, Storage 5
5. Equipment Check 5
6. Mechanical Seal Installation 7
   - 6.1 Installation of Cartridge Type Seal with Setting Plates 8
   - 6.2 Installation of a Cartridge Type Seal with Centering Tabs 9
   - 6.3 Installation of a Component Type Seal 10
   - 6.4 Installation of Seals with Hooked Sleeves (overhung pumps) 11
7. Piping Instructions 12
8. Performance Testing of Pumps 12
9. Functional Recommendations 13
10. Shut Down, Disassembly 14
11. System Check 15
12. Spare Parts, Repairs 15

Experience In Motion

1. Drawing, Brief Description, Explosion Protection, Functional Requirements

! This mechanical seal is designed to provide reliable performance under a wide range of operating conditions. The information and specifications presented in this product brochure are believed to be accurate, but are supplied for information purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, with respect to the product.

Although Flowserve Corporation can provide general application guidelines, it cannot provide specific information for all possible applications.

The purchaser/user must therefore assume the ultimate responsibility for the proper selection, installation, operation and maintenance of Flowserve products. Because Flowserve Corporation is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice.

1.1 Assembly Drawing

The assembly drawing is included in the shipping box with the mechanical seal.

1.2 Brief Description

A mechanical seal is a device designed to seal a rotating shaft against a stationary housing, e.g. a pump shaft against a pump casing. The stationary components will consist of a seal ring and (depending on the design) a spring-loaded element. The spring-loaded element can be a spring or a bellows. The seal ring is sealed against the housing with a secondary gasket, e.g. an O-ring. The rotating components will consist of a seal ring and (depending on the design) a spring-loaded element.

The spring-loaded element can be a spring or a bellows. The seal ring is sealed against the shaft with a secondary gasket, e.g. an O-ring.

A mechanical seal can be supplied as a pre-assembled cartridge or in separate components. Assembly is done in accordance with the assembly drawing. A mechanical seal will run in the pumped product or external source fluid. Liquid seals must always have a film of liquid present between the seal faces. Gas seals must always have a film of gas present between the seal faces. The sealing surfaces are separated from each other by a fluid film (liquid or gas) during shaft rotation and in principle run without contact and thus minimal wear under these conditions.

1.3 Explosion Protection

The mechanical seal is regarded as a machine element. Machine elements do not need to comply with Directive 2014/34/EU (ATEX 114 product guide) as these are regarded as an integral part of a larger piece of machinery (pump, agitator). This has been confirmed by both the EC ATEX standing committee as well as the European Sealing Association (ESA).

For applications which require information on expected surface temperatures of the mechanical seal faces, Flowserve document “ATEX 153 information declaration” is available upon request. This document allows users to determine typical surface temperatures based upon seal design, operating conditions and face materials and may be used by the users to comply with ATEX 1999/92/EC (ATEX 153).

1.4 Functional requirements

The proper functioning of a mechanical seal is only achieved once the following conditions have been met:

- The sealing surfaces are lapped within specification
- Perpendicularity and concentricity between the shaft and the seal chamber face and bore respectively
- Freedom of movement of the spring-loaded components in axial direction
- Axial and radial shaft movements within Flowserve or OEM tolerances whichever is the tightest
- The seal is used under the conditions for which it was selected
- The equipment in which the seal(s) is (are) installed is operated within normal parameters (no cavitation, excess vibration etc.)
- Prevention of sedimentation on shaft or sleeve surfaces caused by for instance crystallisation or polymerisation
- Permanent liquid or gas film between the sealing surfaces, depending on seal type

Failure to meet these requirements will result in excessive leakage and / or shortened seal life and may result in high component and surface temperatures (see the directive 2014/34/EU, 1999/92/EC and EN 13463-5).

2. Safety

DANGER:

This means that personal danger or major material damage can occur when no attention is paid to this.

! ATTENTION:

This means that important information is pointed out that may also be overlooked by skilled personnel. The information can be important to avoid personal injury or material damage.

Please read these instructions carefully. Installation in accordance with the following instructions will contribute to long and trouble-free running of the mechanical seal. For related mechanical seal auxiliary equipment (reservoirs, coolers, etc.), separate instructions will be provided.

The ultimate user must ensure that personnel assigned to handle, install and run the mechanical seal and related equipment is well acquainted with the design and operating requirements of such equipment.

! For this personnel it may be required to wear protective clothing as per the plant's safety regulations.

Damage to any of the seal components and in particular the faces may cause (excessive) leakage in liquid or gas form. The degree of hazard depends on the sealed product and may have an effect on people and / or the environment. Components coming into contact with leakage must be corrosion resistant or suitably protected. Normal seal leakage should not result in the formation of an explosive mixture. Plant regulations concerning work safety, accident prevention and pollution must be strictly adhered to.

This mechanical seal has been designed and built to seal rotating equipment. Damages resulting from use in other applications are the responsibility of the user.

Failure, recovery or fluctuation in power supply to the machine and/or supply system may not expose persons or environment to dangerous situations or harm the functionality of the mechanical seal.

Guards that are provided by the equipment manufacturer have to be in accordance with plant regulations, but should not create additional danger. These guards have to ensure proper access to the working area required for maintenance to the mechanical seal.

The electricity supply of the equipment must be in accordance with directive 2006/95/EC. When machinery is powered by a source of energy other than electricity this may not cause dangerous situations for persons and environment.

3. General

All illustrations and details in these installation and maintenance instructions are subject to changes that are necessary to improve product performance without prior notice.

The copyright of these instructions is the property of Flowserve. These instructions are intended for Maintenance, Operating and Supervisory personnel and contain regulations and drawings of a technical character that may not, in full or in part, be copied, distributed, or used without authorization for competitive purposes, or given to others.

! It should be understood that Flowserve does not accept any liability for instances of damage and/or malfunctioning incurred through non-adherence to these installation instructions.

4. Transport, Storage

The mechanical seal and related equipment must be transported and stored in the unopened, original shipping box. The warehouse in which the mechanical seals and related equipment are stored must be dry and free of dust. Avoid exposing equipment to large temperature fluctuations and radiation.

Parts or complete mechanical seals that have been dropped or otherwise have been subjected to heavy impacts during transport must not be installed. An inspection by Flowserve or its appointed representative is strongly advised.

After a storage period described in FIS222, Flowserve Mechanical Seal and Seal Support System Storage, the mechanical seal must be inspected for its "as new" properties. This applies in particular to the seal faces and secondary sealing elements. An inspection by Flowserve becomes necessary.

! If the equipment is to be preserved with the mechanical seal(s) installed, the preserving medium must not impair the function of the mechanical seal by e.g. fouling of the seal faces and/or attack the secondary seals.

! The mechanical seal can in principle be transported with suitable means like lifting accessories.

5. Equipment Check

! 5.1 Follow plant safety regulations prior to equipment disassembly:

- 5.1.1 Wear designated personal safety equipment
- 5.1.2 Isolate equipment and relieve any pressure in the system
- 5.1.3 Lock out equipment driver and valves
- 5.1.4 Consult plant Safety Data Sheet (SDS) files for hazardous material regulations

5.2 Disassemble equipment in accordance with the equipment manufacturer's instructions to allow access to seal installation area.

5.3 Remove existing sealing arrangement (mechanical seal or otherwise). Clean seal chamber and shaft thoroughly.

! 5.4 Inspect surfaces under gaskets to ensure they are free from pits or scratches. Break all sharp corners on shaft steps, threads, reliefs, shoulders, key ways, etc. over which gasket(s) must pass and/or seal against.

5.5 Check shaft or sleeve OD, seal chamber bore, seal chamber depth, gland pilot, stud diameter, stud bolt pattern and distance to first obstruction to ensure they are dimensionally the same as shown in the seal assembly drawing.

! 5.6 Check seal assembly drawings for any modifications (reworks) to be made to the equipment for mechanical seal installation and act accordingly.

! 5.7 The equipment must be earthed to prevent sparks due to static electricity discharge.

! Shaft runout should be checked against the equipment manufacturer's specifications. Generally, should not exceed 0,05 mm (0.002 inch) TIR (Total Indicator Reading) at any point along the shaft for ball or roller type bearings. For sleeve type bearings, refer to manufacturer instructions. If the equipment is not completely dismantled, verify runout near seal location.

The above values apply to shaft speeds in the range from 1000 to 3600 RPM. For values ult your Flowserve representative. See Figu 1.

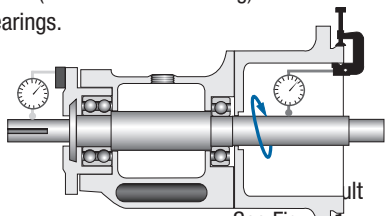


Figure 1

! Shaft endplay should not exceed 0,25 mm (0.010 inch) TIR, regardless of thrust bearing type. See Figure 2.

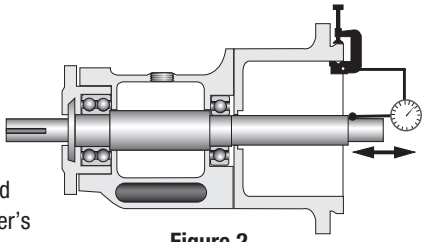


Figure 2

! Radial bearing play at seal chamber face should be checked against the equipment manufacturer's specifications. Generally 0,05 - 0,10 mm (0.002 - 0.004 inch) will be applicable for ball or roller type bearings. For sleeve or journal type bearings, values will generally be in the order of 0,10 - 0,15 mm (0.004 - 0.006 inch). If equipment is found outside the general range, contact the equipment manufacturer and your Flowserve representative to verify the equipment's suitability for the seal.

! Seal chamber squareness to the shaft centerline should be within 0,0005 mm/mm (0.0005 inch/inch) of seal chamber bore TIR. Note: make sure that shaft endplay does not affect the reading. Verify the smoothness of the seal chamber face for a good gasket joint. See Figure 3.

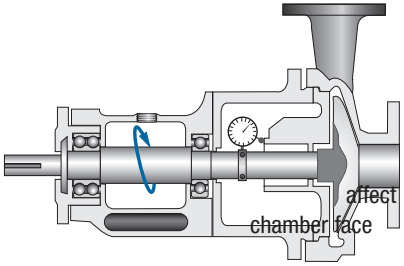


Figure 3

! Concentricity of the shaft to the seal chamber bore or gland pilot regster should be within 0,025 mm per 25 mm shaft diameter (0.001 inch per 1 inch shaft diameter) to a maximum of 0,125 mm (0.005 inch) TIR. See Figure 4.

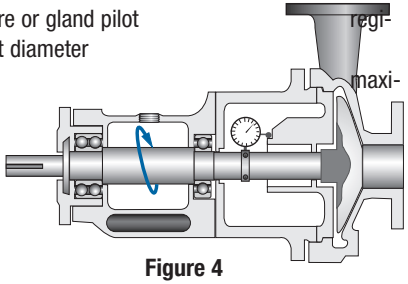
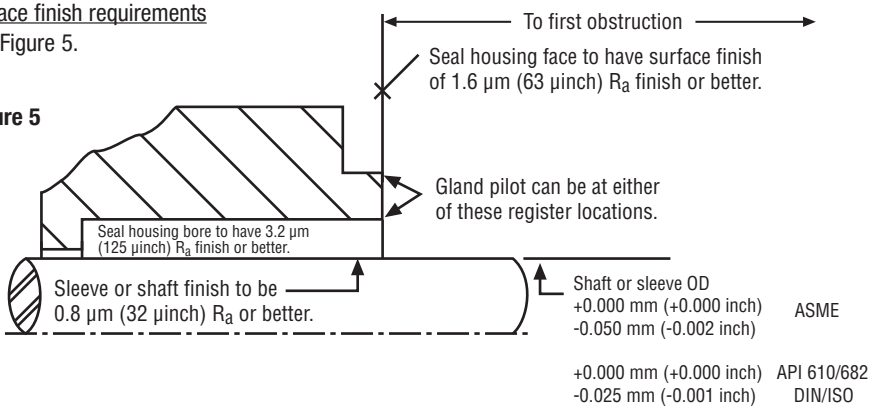


Figure 4

Surface finish requirements
See Figure 5.

Figure 5



6. Mechanical Seal Installation

Verify that the mechanical seal is in accordance with the order documents, to ensure that the correct seal is being installed.

Take care that seal cartridge or components of the seal are handled and carried safely during installation of mechanical seal and that the ergonomic principles are followed. In order to prevent personal injuries the operator should also wear protective clothing as per the plant's safety regulations.

Correct seal setting is important for running a mechanical seal successfully.

! Incorrect seal setting can lead to malfunction of the mechanical seal and consequent leakage of sealed product into the environment.

Cartridge seals unitize the complete seal assembly on a sleeve such that the entire seal is installed simultaneously. Component seals are assembled sequentially on the equipment and require careful measurements to properly locate and lock the rotating components relative to the stationary components. When measuring the setting or securing cartridge seals, always make sure the shaft is in the same position as when the equipment is operating (e.g. including the effects of thermal growth or contraction of the shaft relative to the casing).

To ease installation, gaskets may be lightly lubricated. Lubricant must be compatible with both handled product and gasket material. Generally, silicon grease is suitable but this should be verified before applying.

! Caution: avoid over compressing a bellows. This could result in reduced spring force and length.

Some mechanical seals are sensitive to direction of rotation. Verify that the direction of rotation of the shaft corresponds to that of the mechanical seal before installation.

Precautions must be taken for parts of the mechanical seal that will be used as support to step on during assembly operations. These parts must be protected against slipping, stumbling or falling (for example by using a strut).

6.1 Installation of Cartridge Type Seal with Setting Plates

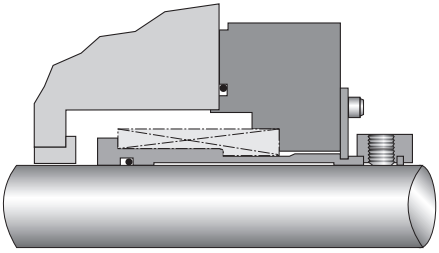


Figure 6

See figure 6.

6.1.1 Check assembly drawing, bill of material and seal assembly prior to installation.

6.1.2 Install the seal onto the shaft and locate the gland against the face of the seal chamber.
Adjust the bearings, coupling, and impeller so that the shaft is in its operating axial position. This shaft position must be used to check all seal setting (SS) dimensions during installation. Disassemble equipment to allow access to seal installation area.

6.1.3 Orient the ports on the seal gland(s) as indicated by the seal assembly drawing and connecting piping.

6.1.4 Evenly torque gland bolts/nuts to prevent cocking of the gland or uneven gland pressure against the seal chamber.

Do not tighten drive arrangement screws.

6.1.5 Complete the remaining equipment assembly including thrust bearings, if applicable.

6.1.6 Ensure the setting plates are correctly located and engaged.

! Incorrect position of the setting plates can lead to malfunction of the mechanical seal and consequent leakage of sealed product into the environment.

6.1.7 Tighten drive arrangement screws to the torque values shown on the seal assembly drawing.

Inaccurate tightening of these screws can lead to unsafe situation as mechanical seal may move out of the seal chamber when pressure is applied.

6.1.8 Assemble interconnecting piping as per API-plan and piping instructions as given in paragraph 7. See also (if applicable) auxiliary system installation and maintenance manual.

6.1.9 Disengage setting plates from the sleeve and secure tightly in disengaged position.

! Ensure that plates cannot fall back onto the sleeve as to prevent risk of contact between rotating and static parts.

6.1.10 Inspect equipment and driver alignment in accordance with coupling and / or equipment manufacturer's instructions.

6.1.11 After bringing the unit up to operating conditions (pressure and temperature), recheck pump to driver alignment. Make adjustments as necessary.

6.2 Installation of a Cartridge Type Seal with Centering Tabs

See figure 7

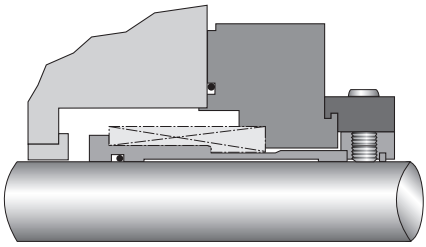


Figure 7

6.2.1 Check assembly drawing, bill of material and seal assembly prior to installation.

6.2.2 Install the seal onto the shaft and locate the gland against the face of the seal chamber.

6.2.3 Orient the connections on the seal gland(s) as indicated by the seal assembly drawing and connecting piping.

6.2.4 Install gland bolts/nuts, but do not tighten. The gland must be free to move radially.

6.2.5 Complete the remaining equipment assembly including thrust bearings, if applicable.

6.2.6 Ensure the centering tabs are correctly located and engaged.

! Incorrect position of the setting plates can lead to malfunction of the mechanical seal and consequent leakage of sealed product into the environment.

6.2.7 Evenly torque gland bolts/nuts to prevent cocking of the gland or uneven gland pressure against the seal chamber.

6.2.8 Tighten drive arrangement screws to the torque values shown on the seal assembly drawing.

⚠ Inaccurate tightening of these screws can lead to unsafe situation as mechanical seal may move out of the seal chamber when pressure is applied.

6.2.9 Assemble interconnecting piping as per API-plan and piping instructions as given in paragraph 7. See also (if applicable) auxiliary system installation and maintenance manual.

6.2.10 Remove centering tabs and store them in a known place.

6.2.11 Inspect equipment and driver alignment in accordance with coupling and / or equipment manufacturer's instructions.

6.2.12 After bringing the unit up to operating conditions (pressure and temperature), recheck pump to driver alignment. Make adjustments as necessary.

6.3 Installation of a Component Type Seal

See figure 8.

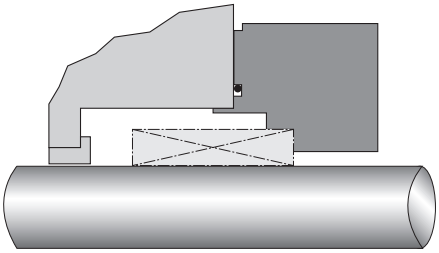


Figure 8

6.3.1 Check assembly drawing, bill of material and seal components prior to installation. Ensure seal faces and joints are free of scratches, contamination and other damage. Prior to installation, wipe lapped surfaces clean with a lint free cloth and quick drying solvent. Lubrication of seal faces is not recommended unless specified on the seal assembly drawing.

6.3.2 Assemble seal chamber and shaft (including thrust bearings, if applicable) and verify/scribe the seal setting distance as shown on the assembly drawing. Other setting aids such as spacer rings may be indicated on the assembly drawing.

! Please note that incorrect seal setting can lead to malfunction of the mechanical seal and consequent leakage of sealed product into the environment.

6.3.3 When applicable, pre-assemble the rotating and stationary components or sub-components of the seal in accordance with the assembly drawing.

6.3.4 Assemble the seal components sequentially onto the equipment, fastening the rotating components. Locate the gland(s) against the face of the seal chamber.

6.3.5 Orient the connections on the seal gland(s) as indicated by the seal assembly drawing.

6.3.6 Evenly torque gland bolts/nuts to prevent cocking of the gland or uneven gland pressure against the seal chamber.

6.3.7 Complete the remaining equipment assembly including thrust bearings, if applicable.

6.3.8 Assemble interconnecting piping as per API-plan and piping instructions as given in paragraph 7. See also (if applicable) auxiliary system installation and maintenance manual.

6.3.9 Inspect equipment and driver alignment in accordance with coupling and / or equipment manufacturer's instructions.

6.3.10 After bringing the unit up to operating conditions (pressure and temperature), recheck pump to driver alignment. Make adjustments as necessary.

6.4 Installation of Seals with Hooked Sleeves (overhung pumps)

See figure 9.

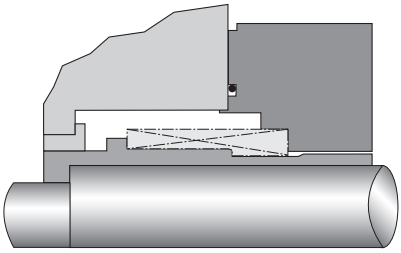


Figure 9

6.4.1 Check assembly drawing, bill of material and seal components prior to installation. Ensure seal faces and joints are free of scratches, contamination and other damage.

Prior to installation, wipe lapped surfaces clean with a lint free cloth and quick drying solvent. Lubrication of seal faces is not recommended unless specified on the seal assembly drawing.

6.4.2 Assemble seal chamber and shaft (including thrust bearings, if applicable) and verify the distance from the seal chamber face to the end of the shaft as shown on the assembly drawing.

! If this distance is not in accordance with dimension on assembly drawing the setting of the mechanical seal will be incorrect and this can lead to malfunction of the mechanical seal and consequent leakage of sealed product into the environment.

6.4.3 When applicable, pre-assemble the rotating and stationary components or sub-components of the seal in accordance with the assembly drawing.

6.4.4 Assemble the seal components sequentially onto the equipment. Locate the gland(s) against the face of the seal chamber. If applicable, install drive keys as indicated on the seal and/or pump assembly drawing.

6.4.5 Orient the connections on the seal gland(s) as indicated by the seal assembly drawing and connecting piping.

6.4.6 Evenly torque gland bolts/nuts to prevent cocking of the gland or uneven gland pressure against the seal chamber.

6.4.7 After the impeller nut is properly torqued, check that the sleeve is completely seated

6.4.8 Complete the remaining equipment assembly including thrust bearings, if applicable.

6.4.9 Assemble interconnecting piping as per API-plan and piping instructions as given in paragraph 7. See also (if applicable) auxiliary system installation and maintenance manual.

6.4.10 Inspect equipment and driver alignment in accordance with coupling and / or equipment manufacturer's instructions.

6.4.11 After bringing the unit up to operating conditions (pressure and temperature), recheck pump to driver alignment. Make adjustments as necessary.

Parts of the mechanical seal that are moving during operation of the machine (for example drive collar) have to be protected against contact with guards that are in accordance with specifications of manufacturer from the machine.

7. Piping Instructions

Piping instructions are detailed on the mechanical seal assembly drawing.

These instructions must be followed precisely to ensure correct seal operation. Ensure that piping is connected to the correct pipe ports to prevent unsafe situations. For auxiliary systems: carefully read the maintenance instructions provided with the system.

The connections on the mechanical seal are properly marked.

Minimize restrictions, especially in closed loop piping arrangements. Unless otherwise specified, the minimum internal diameter for pipe, tubing and connecting hardware should be 12,7 mm (.500").

Total pipe length and number of bends should be kept to a minimum. Use smooth, large radius bends; do not use elbows, tees, etc. Orifices should be installed as far away from the seal gland as possible. An exception to this rule should be made for orifices fitted to drain piping. To avoid clogging of the orifice it is advisable to install it in the seal gland so that the generated heat will serve to keep the leaked product fluid.

For "loop type" systems (API-plan 23, 52 and 53 A, B, C)

Pipe runs should be sloped continuously up or down to allow adequate circulation, proper venting and draining. Make sure that the loop, including seal gland, does not include vapor traps. Unless otherwise specified, reservoirs and coolers must be mounted 40 to 60 cm (15" to 24") above the seal inlet or outlet connection, whichever is the highest, to promote thermosyphoning in standby condition.

Seals equipped with excess leakage detection

Excess leakage detection, often used with single or non-pressurized dual seals, is commonly achieved by monitoring liquid level or pressure increases. With such an arrangement, the drain line for normal leakage must slope downward continuously to the point of exit (e.g. sump). Refer to the seal assembly drawing for additional piping requirements including the proper location of the restriction orifice and instrumentation.

8. Performance Testing of Pumps

Pump manufacturers will often perform pump performance tests on water with the mechanical seal installed. If the pump product used during field operation is not equal to water, seal designs and face materials require special precautions to prevent damage to the seals during these tests. For example, on seals with two hard faces, the seals may be provided with faces in alternate materials more

suitable for the pump test medium. These faces are to be replaced with faces in the selected materials at the conclusion of the testing. A mechanical seal equipped with a hard face combination can be safely operated on water provided the pressure does not exceed 5 bar (72.5 psi) and the speed does not exceed 10 m/s (32.8 fps).

When high temperature seals with graphoil gaskets are tested on water during a pump performance test, the seals must be carefully dried after the test to prevent vaporization of water absorbed by the gaskets when the pump is brought to its (high) operating temperature.

Contact your Flowserve representative for additional information.

9. Functional Recommendations

! 9.1 The pressure and temperature in the seal chamber or of the barrier fluid must not exceed the recommended maximum seal limits. The shaft speed must also not exceed the seal's limits.

! 9.2 For seals using external cooling and/or an external flush, apply cooling and / or flush prior to seal start-up. Avoid inadvertent operation of valves located in the cooling system that might result in shutting off the cooling flow.

9.3 Single and dual non-pressurized (tandem) seals require adequate vapor pressure margin in the seal chamber to prevent flashing of the product at the seal faces.

9.4 Dual non-pressurized (tandem) seals require the buffer fluid pressure to be maintained at a value lower than the seal chamber pressure. Buffer fluid pressure is usually equal to atmospheric or vapor recovery system pressure, unless otherwise specified.

9.5 Dual pressurized (double) seals require the barrier fluid pressure to be maintained at least 2 bar (30 psi) above the seal chamber pressure, unless otherwise specified. It is imperative to pressurize the barrier prior to pressurizing the equipment. Likewise, do not de-pressurize the barrier system until the equipment has been fully isolated, depressurized and vented.

9.6 Flowserve can supply information on barrier fluid temperature and flow requirements based on product type, seal size, product temperature, barrier fluid characteristics and shaft speed. The buffer/barrier fluid must contain little or no additives for anti-wear/oxidation. Automotive antifreeze should never be used. Ensure that the barrier fluid is clean and compatible with the product.

9.7 This seal is designed to resist corrosion by the product(s) listed on the assembly drawing. Do not expose the seal materials to products other than those shown on the assembly drawing. The seal assembly drawing lists the materials of construction. Consult your Flowserve representative when in doubt or when using the seal for another application than for which it was selected.

9.8 Liquid seal requirements: Do not start the equipment dry. Open valves to flood equipment with product. Vent all air and/or product vapor from the equipment casing and the seal chamber before start up. Vent casing and tubing of heat exchange (if applicable).

Process fluid must flood and pressurize the seal chamber at all times for single seal and non-pressurized dual seals. Barrier fluid must flood dual seals at all times during equipment operation.

Gas seal requirements: Do not apply liquids to gas seal designs. Non-pressurized dual seals with the outboard seal designed to work in gas must be connected only to a gas purge, if applicable.

9.9 When required, dry steam should be applied to the quench connection. Use a needle valve (or other flow restriction) to provide 0.1 bar (1 to 1.5 psi) steam to the quench connection on the seal gland.

Take care to apply steam pressure gradually to prevent an unsafe situation due to an excessive flow of hot steam being blown into the operator's working area.

This should result in wisps of steam exiting the seal gland area. Ensure that all condensate is drained from the supply line and open the steam quench slowly before the pump is preheated to prevent thermal shock.

9.10 Start up equipment in accordance with normal maintenance procedures unless specifically requested otherwise by Flowserve. If the equipment is not operating properly (e.g. seals and / or bearings running hot, cavitation, heavy vibration, etc.), shut down the equipment, investigate and remove the cause.

The temperature of the external of the mechanical seal depends from the operating temperature of the product and/or barrier fluid. Proper precautions need to be taken to prevent contact with hot parts.

Points 9.1 to 9.10 must be taken into account during the first start up as well as during restarts after machine was stopped.

10. Shut Down, Disassembly

The equipment can be shut down at any time. Before the mechanical seal can be removed the equipment must be de-pressurized and drained.

! Operator must persuade himself before starting disassembling of mechanical seal that the external of the equipment is cool enough to be handled without risk.

Barrier pressure (if applicable) must be relieved after the equipment has been de-pressurized.

Dismantling of the mechanical seal is only allowed after machine has been stopped.

Product may be released during removal of the mechanical seal. Safety measures and protective clothing may be required as per the plant's safety regulations.

Further disassembly of the mechanical seal must be done according to the supplier's specifications.

11. System Check

Checking of the system, limits itself to monitoring pressure, temperature, leakage and consumption of barrier (buffer) fluid, when applicable.

Maintenance to the mechanical seal is only allowed after machine has been stopped.

The required area for operating the machine or doing maintenance to the mechanical seal must be easy accessible.

12. Spare Parts, Repairs

Repairs will be necessary when the seal reaches the end of its normal life expectancy or when it has been running outside of its design capabilities.

This product is a precision sealing device. The design and dimensional tolerances are critical to seal performance. Only parts supplied by Flowserve should be used to repair this seal. These are available from the numerous Flowserve stocking locations.

To order replacement parts, refer to the part code, order number or B / M number, which can be found on the assembly drawing. It is recommended to keep a spare seal on stock to reduce equipment downtime.

All liabilities and warranties to Flowserve for damage incurred through the use of non-original replacement parts and accessories will be rendered null and void.

Please note that special manufacturing and delivery specifications exist for all parts of our products manufactured or produced by ourselves and the replacement parts are always offered in accordance with the latest technology and with the most current regulations and laws.

Flowserve seals can normally be reconditioned. When repair is necessary, the seal should be carefully removed from the equipment (reinstall the centering tabs or setting plates if applicable).

! Decontaminate the seal assembly and return it to a Flowserve authorized repair facility with an order marked "Repair or Replace". A signed certificate of decontamination must be attached.

A Safety Data Sheet (SDS) must be enclosed for any product that came in contact with the seal. The seal assembly will be inspected and, if repairable, a quotation will be made for restoring it to its original condition. Upon acceptance of the quotation, the parts will be rebuilt, tested, and returned to sender.

English

FLOWSERVE

TO REORDER REFER TO
B/M #_____
Order #_____

FIS144-11 (EN/A5) May 2024

To find your local Flowserve representative
and find more about Flowserve Corporation,
visit ***www.flowserve.com***

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, running, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.
While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

USA and Canada
Kalamazoo, Michigan USA
Telephone: 1 269 381 2650
Telefax: 1 269 382 8726

Europe, Middle East, Africa
Etten-Leur, the Netherlands
Telephone: 31 765 028 200
Telefax: 31 765 028 487

Asia Pacific
Singapore
Telephone: 65 6544 6800
Telefax: 65 6214 0541

Latin America
Mexico City
Telephone: 52 55 5567 7170
Telefax: 52 55 5567 4224

© Copyright 2024 Flowserve Corporation