

SEALING SENSE

How can I reduce consumption of seal water going to my packing and mechanical seals?

Two imperatives for many of today's industrial plants are to reduce the cost of operations through the enhancement of rotating equipment reliability and enhanced energy efficiency of pumping systems.

One place to look for a significant, yet relatively easy "quick win," is the seal flush water going to packing, single, and double seals. In many industrial plants water is being used to provide lubrication, cooling and/or as a means to exclude a harmful process fluid from the stuffing box or seal chamber.

The means for providing an external water flush or quench are generally described as API/ISO piping plans 32, 54 (ANSI 7354) or 62 (ANSI 7362).

These plans have certain potential issues that can be opportunities for improving operating costs, namely:

- Higher flow rates than required for optimal packing or seal performance.
- Lower flow rates than required for optimal packing or seal performance.
- Orifices plugging with no readily accessible means to clean them.
- Cumbersome and space consuming piping configurations in order to include basic requirements of an appropriate system, such as pressure and flow control as well as monitoring, check valve and low flow alarm.

A potential solution to address these issues would be a single compact unit that includes all of the functionalities below:

- Allows the end-user to readily optimize seal water pressure and flow to maximize packing and mechanical seal MTBR.
- Enables the end-user to readily monitor the seal water pressure and flow.
- Conveniently and economically incorporates a low flow alarm while still maintaining a minimal piping footprint.
- Saves space.
- Typically will reduce seal water consumption by about 1/3rd while optimizing packing and

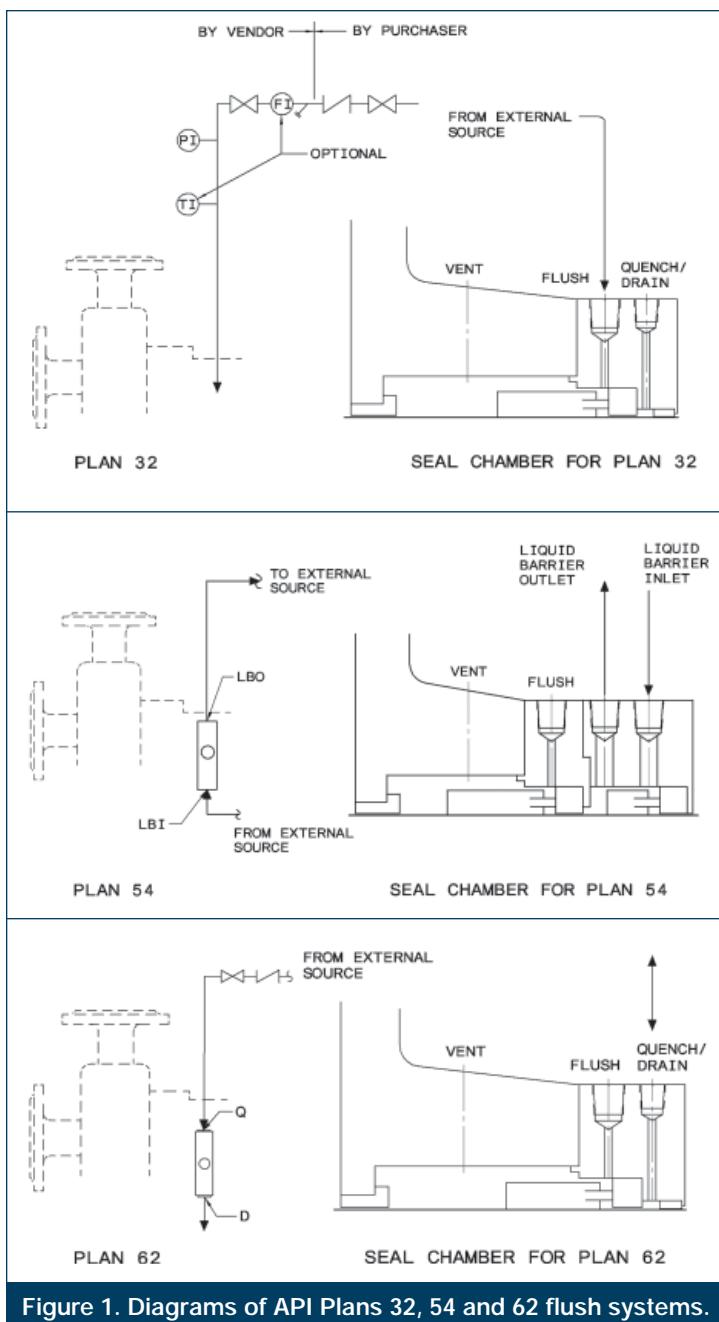


Figure 1. Diagrams of API Plans 32, 54 and 62 flush systems.



Figure 2. Typical Compact Flush Water Monitor

mechanical seal performance.

- Reduces process dilution.
- Can enhance rotating equipment reliability by alerting plant personal to a low flow condition that could lead to an unplanned maintenance event.
- Easy to maintain with readily accessible cleaning button that does not disturb flow or pressure.

Water quality is an important consideration. Plant water quality can vary significantly from one location to another and affect these units, so it should be monitored. Inspection and maintenance procedures should take water quality into consideration. It also is always best to consult with your seal supplier

Number of stuffing boxes	100
Estimated current average seal water flow per stuffing box	3-gpm
Average reduction in seal water consumption per stuffing box	1-gpm
Current seal water consumption	157,680,000-gallons /year
Seal water consumption optimized resulting in 33 percent reduction	52,034,400-gallons/year
Savings in water consumption	47,304,000-gallons/year
Cost of water per 1,000 gallons*	\$0.90
Savings per year	\$46,830**

* Based on blended cost of water and sewer for industrial users in a Midwestern U.S. City with 20 percent of seal water flow going to sewer.

** In addition to these savings, the end-user may realize additional benefits from reduced process dilution and with the low flow alarm, potentially saving an unplanned maintenance event.

to ensure optimum cooling flow rates for your system.

Above is an example of a way to achieve significant operating savings through optimizing seal water flush. The basis is reduction in seal water consumption by an average of 1-gpm per stuffing box served.

The bottom line on how to reduce consumption of seal water going to packing and mechanical seals is to consider replacing your existing seal water flush piping plan with a single unit seal water flush control and monitoring device. You will save operating costs as well as space.

Next Month: *How do I troubleshoot compression packing?*

Fluid Sealing Association

Sealing Sense is produced by the **Fluid Sealing Association** as part of our commitment to industry consensus technical education for pump users, contractors, distributors, OEMs, and reps. *This month's Sealing Sense was prepared by FSA Member Tom Haan.* As a source of technical information on sealing systems and devices, and in cooperation with the **European Sealing Association**, the FSA also supports development of harmonized standards in all areas of fluid sealing technology. The education is provided in the public interest to enable a balanced assessment of the most effective solutions to pump technology issues on rational Total Life Cycle Cost (LCC) principles.

The **Mechanical Seal Division** of the FSA is one of five with a specific product technology focus. As part of their educational mission they develop publications such as the *Mechanical Seal Handbook*, a primer intended to complement the more detailed manufacturer's documents produced by the member companies. Joint FSA/ESA publications such as the *Seal Forum*, a series of case studies in pump performance, are another example as is the *Life Cycle Cost Estimator*, a web-based software tool for determination of pump seal total Life Cycle Costs. More recently, the *Sealing Systems Matter* initiative has been launched. It is directed to support of the case for choosing mechanical seals that optimize

life cycle cost, safety, and environmental compliance.

The following members of the **Mechanical Seal Division** sponsor this *Sealing Sense* series:

Advanced Sealing International (ASI)
 Ashbridge & Roseburgh Inc.
 A.W. Chesterton Co.
 CoorsTek
 Daikin America, Inc.
 DuPont Performance Elastomers LLC
 EagleBurgmann Industries LLP
 Flex-A-Seal, Inc.
 Flowserve Flow Solutions Div. - Seal Group
 Garlock Sealing Technologies
 Greene, Tweed & Co./Palmetto, Inc.
 Industrias Vago de Mexico SA de CV
 John Crane
 KC America
 Latty International S.A.
 Metallized Carbon Corp.
 Morgan AM&T
 Parker Hannifin – Seal Group
 PPC Mechanical Seals
 SEPSCO - Sealing Equipment Products Co., Inc.
 Simrit - Div. of Freudenberg-NOK
 SGL Technic Polycarbon Division