

Reliable.



Tank Storage Industry

Pump Seals for the Tank Storage and Fuel Distribution Industry



EXPERIENCE THE EXCEPTIONAL



Reliable Sealing Solutions.

Tank storage and distribution facilities are used for storing a wide variety of materials e.g. liquid fuels, chemicals, gases, biofuels, edible oils. They are located all over the world and are designed to cater for variations in demand, price, and stockpiling of vital resources or raw materials.

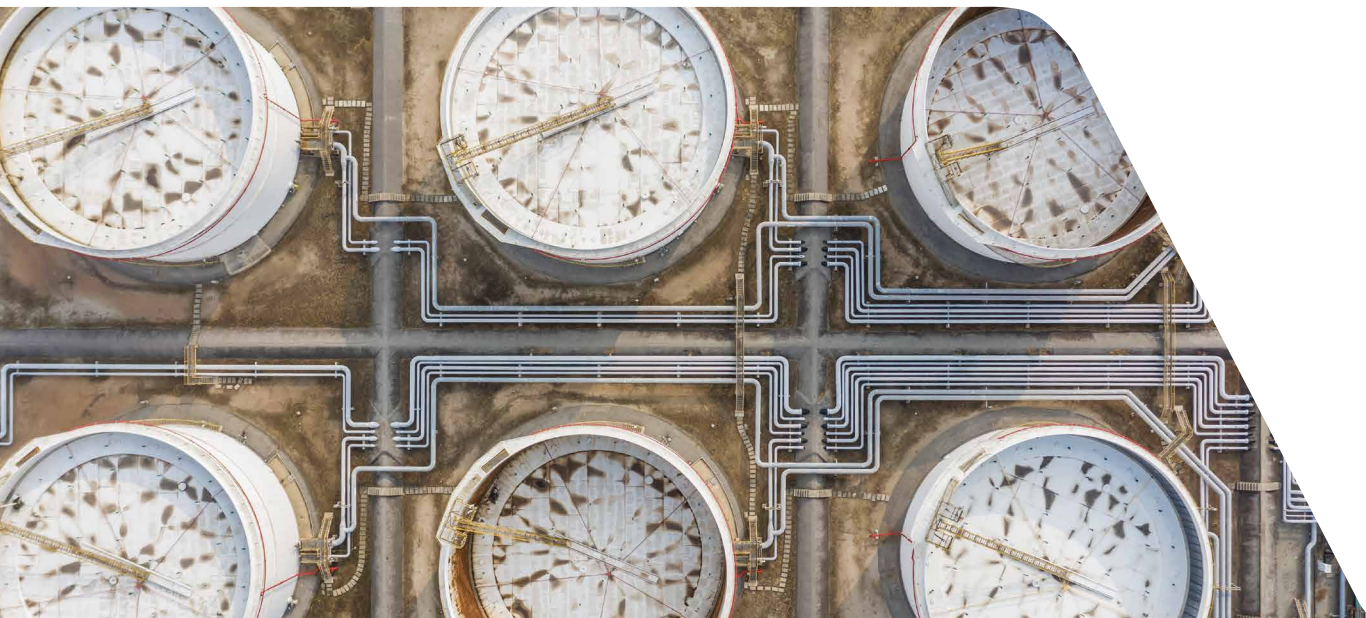
Typically these storage facilities are found alongside oil refineries, at major shipping ports and distribution hubs performing a major role in linking suppliers to their market users.

AESSEAL® is a world leading provider of quality mechanical seals, but we're far more than just a supplier of new and replacement parts.

We're an industry pioneer with a total and utter focus on achieving exceptional quality in terms of products, technical innovation, customer service and after sales support. Established in 1979, we've grown to become a major global player in the seals industry, operating from 230 locations and supplying customers in 104 countries.

Our unique modular technology enables us to respond quickly and effectively to even the most demanding technical challenge or delivery deadline. More critically, our seals deliver increased reliability, and reduced cost of ownership – and we have the evidence and customer references to prove it. We aim to deliver exceptional service and exceed expectations, and everything we do – from manufacturing and administration to distribution and after sales support – is focused on redefining the customer experience. We believe that once we've worked together, you will never need look for another supplier.

“ We aim to design and manufacture products which exceed expectations for reliability and performance. ”





As well as holding one of the world's most comprehensive 'standard inventory' portfolios of mechanical seals, bearing seals, seal support systems and packing, we have made a £multi-million up-front investment in creating an industry defining range of products.

At the heart of this lies our unique modular technology, which means we're able to streamline the order process and deliver against even the most challenging lead times. Our customer philosophy, like our ordering process, is simple: we'll do whatever it takes, to deliver whatever's needed. Our aim is to consistently exceed expectations.

Investment

We have invested heavily in testing and in state of the art computer controlled machinery which has helped increase productivity and reduce costs, bringing our customers the best 'value for money' products in the industry. Nobody in our sector is doing more.

Modular Technology

We have developed a unique and patented range of pre-engineered seal components which enables some 10 million permutations to be configured, meaning we can rapidly assemble and despatch solutions to meet virtually any application – faster and more cost-effectively than any other supplier. The result? Bespoke quality with off-the-shelf turnaround and cost, and seals which surpass our customers' expectations for the reliability of their rotating equipment.

Customer Service

Our aim to redefine the customer experience is embedded within our culture. All employees are encouraged to champion the customers' cause, to identify improvements in our offer, and to challenge the business to find new and better ways of working. We believe exceptional is achievable.

Ethical

We're totally committed to exceeding our corporate, environmental and social responsibilities, promoting corporate responsibility in our suppliers, and throughout the supply chain.

Use of Dual Seals

Historically, the tank storage industry has used simple single mechanical seals in rotary pumps, however, dual seals can provide many benefits to the user for safety, reliability and the environment.

- **Safety** — Secondary containment, prevention of spills, seal condition monitoring
- **Reliability** — Provide dry running protection for seals (tank stripping) operations
- **Environmental** — Eliminate VOC and VHAP emissions



Safety and Environmental Protection

Elimination of spills due to seal failures.

Process safety management teams are now identifying the risks from single seals. Leaks and spills from worn out or damaged single seals can go unnoticed and can become notifiable. Volatile organic compound (VOC) emissions from single seals can go undetected.

Controlling these hazards by using dual mechanical seals with appropriate auxiliary systems is now considered industry best practice.

Prevention of spills and equipment malfunctions is achieved by the alarm incorporated in the auxiliary system and via the secondary containment inherent within a dual seal.



- **Acute toxicity**
e.g. caustic, acids, H₂S



- **Aspiration hazards**
e.g. Volatile Hazardous Air Pollutants (VHAP), carcinogenicity / organ toxicity.
e.g. fluids with benzene, MTBE, butadiene



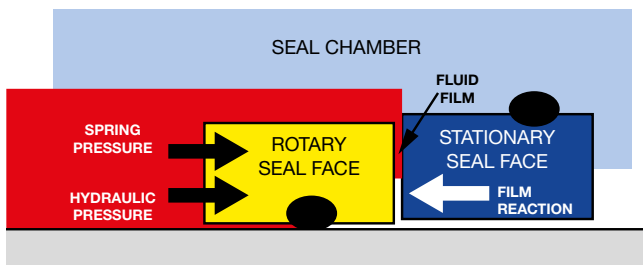
- **Flammable**
e.g. pumping temperature > liquids with flash point <37°C / 100°F,
or hydrocarbons expected to vaporize on release e.g. LPG, gasoline

Reliability (Dry Running Protection)

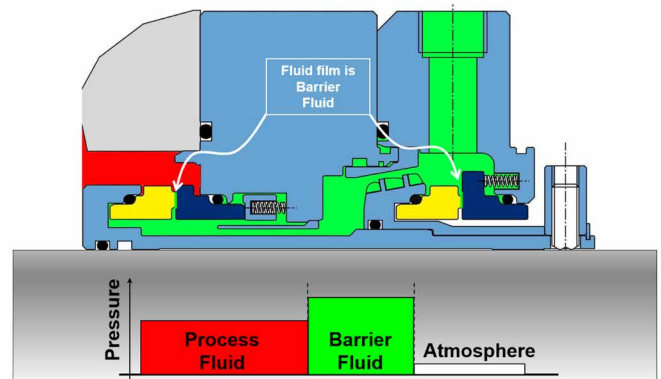
Elimination of damage to seals when tank stripping.

The seal face lubrication regime (fluid film) is often derived from the process fluid. During 'stripping' operations of the pumps, there is intermittent, or no seal face lubrication. During these 'dry running' events, the seal faces are subjected to dry contact. This results in loss of seal face flatness and the surface condition causes excessive leakage / failure.

By using a dual mechanical seal, the fluid film lubrication for both the inner and outer seals is provided by the barrier fluid, thus, in any 'stripping' operation, the inner seal is not starved of lubrication and cooling. The seal will operate indefinitely without process fluid with the seal face heat load transferred to the support system cooling circuit.



Forces acting on the seal faces — The function of the face film is not merely to support the applied loads but also to provide lubrication and heat transfer.

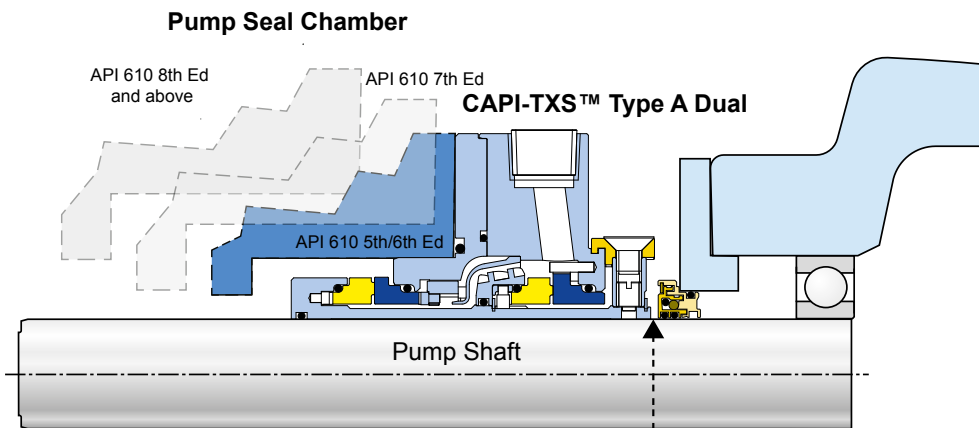


Pressurised dual seals

Dual Seal Upgrade - Unique Solutions - CAPI-TXS™

The CAPI-TXS™ was designed by AESSEAL® specifically for the legacy pumps found in abundance in the tank storage industry.

Using API 682 qualified componentry in a compact modern design means it will fit almost all pumps without modification to the seal chamber.



CAPI-TXS™ Type A Dual

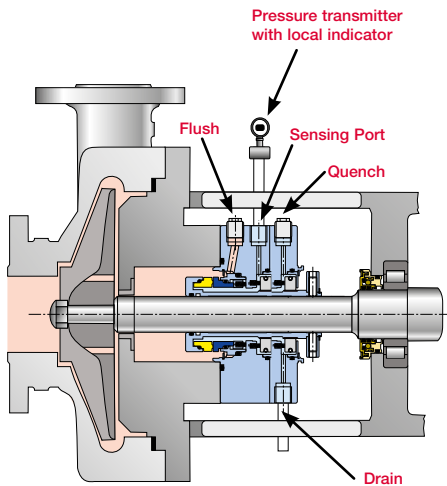
Short length — fits most legacy pumps



Enhancing Safety on Single Seals Leakage Detection

AESSEAL® can provide enhancements to single seals - AESSEAL® cartridge seals used in conjunction with Plan 66A or 66B support systems provide a warning signal to the (control room) of seal leakage.

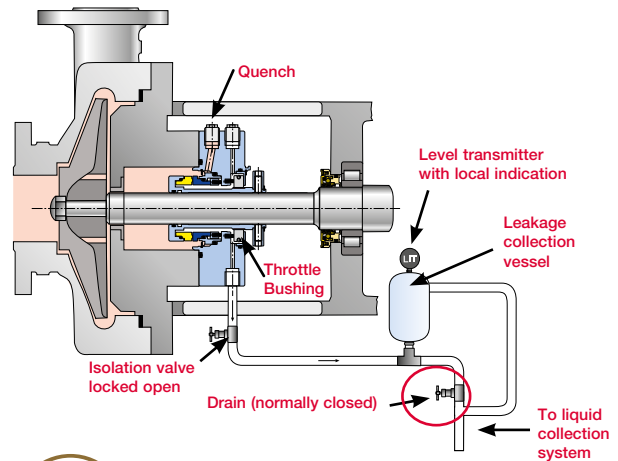
With pumps located in remote areas with conventional single seals, any failures may be unnoticed until leakages accumulate to a major spill.



API Plan 66A

In Piping Plan 66A, a throttle bushing in the seal gland restricts leakage in the event of seal failure. Pressure increase is detected by a pressure transmitter.

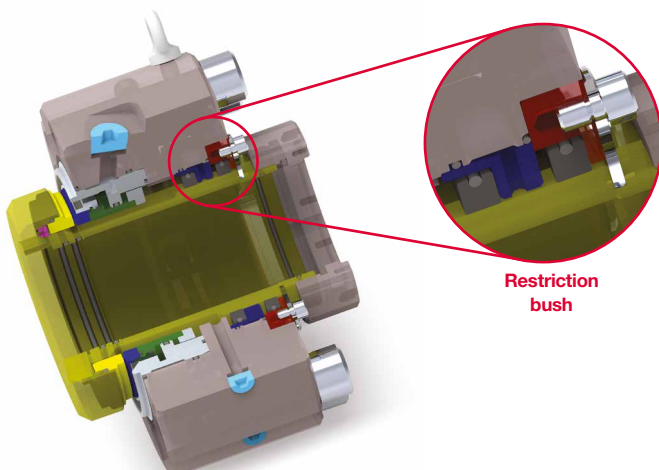
Normal leakage passes the inner restriction bush to drain. Excess leakage is restricted by the inner bush from leaving seal gland, causing a pressure increase which is sensed by the pressure transmitter. Leakage is directed to a liquid recovery system or sump.



API Plan 65B

In Piping Plan 65B, leakage from seal faces is directed to a liquid collection system. A vessel with a high level alarm is provided for detection of cumulative leakage.

It is normally used with single seals where the leakage is expected to be mostly liquid, piping is connected to the drain connection of the gland plate. Leakage is collected in the vessel until the high level alarm is reached. Excessive fill rate indicates seal failure.



Plan 66A seal



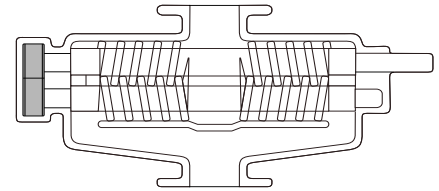
Plan 65B system

Sealing Heavy Fuel Oil (HFO)

Heavy fuel oil is used predominantly by the shipping industry. It is challenging to pump and seal due to its very steep viscosity curve and high pour point.

Positive displacement twin screw pumps are often used; many of these pumps have four sealing positions so seal reliability is crucial to keep down maintenance costs. Many of these pumps are designed so that they can only fit internal component seals.

Pumping temperature should ideally be above 40°C / 100°F to pump.



Twin Screw Pump

Sealing HFO is Challenging

Single seals are often used and can have very high start up torque as the fluid film in between the seal faces cools and causes them to stick together. The SAI™ is an internal component seal that often fits existing DIN 24960 housings. The seal features:

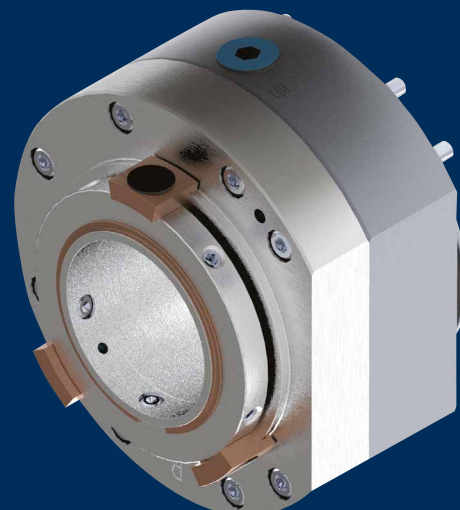
- Heavy duty metal on metal drive (milled lug drive)
- Torque transmitted to the face via a shrinking fit
- Hydraulically balanced seal-face
- Non-shaft-fretting design to reduce cost of equipment overhaul
- Non-clogging design springs out of the pump fluid
- Smooth non-clogging profile



Fuel Oil Pumping / Sealing

Some screw pumps can be converted to dual cartridge seals. This type of seal provides the ultimate solution in terms of reliability and safety. The high torque loads on start up are thus avoided as the seal faces are lubricated by a barrier fluid rather than the heavy viscosity fuel oil.

When connected to an appropriate seal auxiliary system the seals can be condition monitored.



Dual API Cartridge Seal adapted for twin Screw Pump



Our product range

The AESSEAL® product range provides highly innovative sealing solutions for the tank storage industry. Our technology has been successfully applied to a wide range of applications.



SAI™

SAI™ — Internal Balanced Mechanical Seal

- Non-shaft-fretting design to reduce cost of equipment overhaul
- Hydraulically balanced seal-face



CURC™

CURC™ — Single Cartridge Seals

- Self-aligning stationary face, maximizing seal life
- Stationary face with radial locating pins minimizes damage in stop / start applications and viscous fluids



DMSF™

DMSF™ — Double Monolithic Stationary Flow

- Monolithic seal-faces provide maximum face stability in high temperature applications, improving seal life
- Incorporates a highly effective bi-directional pumping scroll to maximize cooling and increase seal life



CAPI™ Type A

CAPI™ — Type A

- Single and dual seal technology
- Category 1,2 & 3 API 682 qualification tested



CAPI-TXS™

CAPI-TXS™ — API 682

- Compact – can be fitted to most API 610 pumps, 5th, 6th, 7th edition and non API 610 pumps, regardless of OEM
- Increased reliability - Cartridge design uses API 682 qualified components. Integral bi-directional internal pumping ring circulates barrier / buffer fluid, reducing seal face temperatures and improving reliability

“ We work with you to manage your assets and increase mean time between failures. ”

AESSEAL® delivers seal auxiliary systems to support all API piping plans. We also supply the most sophisticated range of bearing protection available in the industry.

The result is a holistic product approach that will increase reliability on your site.

Seal Auxiliary Systems

The innovative AESSEAL® modular design process enables the provision of seal auxiliary systems to suit all API piping plans within rapid delivery times. The modular nature also guarantees a simpler order process for you.

All of our systems also comply with the following for your peace of mind:

- API 682
- ASME VIII Div.1
- PED 2014/68/EU
- GOST

A range of instrumentation options are available to adapt your seal auxiliary systems to specific application requirements. To download data sheets and find out more, please visit www.aesseal.com/systems



53B – innovative modular build enables simplicity of selection and quality product within short lead times

Bearing Protection

AESSEAL® is the only company to have a proven long-term solution for containing the oil mist in the bearing housing for the latest API 610 applications.

The LabTecta® and MagTecta™ range of bearing protection technology has a proven ability to increase operating performance on pump, electric motor, pillow block, steam turbine and gearbox equipment. The unique and patented designs enhance bearing life by preventing bearing lubricant contamination. Additionally, the LabTecta®66 is field repairable in a matter of minutes, further helping to reduce downtime issues.

The AESSEAL® bearing protection range conforms to the relevant standards, specifically:

- API 610 Ed.10
- IEEE Std. 841-2001
- British Standard EN60034-5:2001, IP66 rating for LabTecta® range

For more information, or to download data sheets, please visit: www.aesseal.com/bearings



LabTecta®66RDS

Improving Reliability

After five failures in three months on a Diesel back loading pump, a major oil storage facility operator asked AESSEAL® for their assistance.

AESSEAL® recommended that the competitor seal be replaced with an AESSEAL® CAPI™ Type A dual seal along with an API Plan 53B Python seal support system. AESSEAL® committed to supply and installation of the seal and system on a 3-month trial. The seals and systems were delivered to site within 3 weeks of order and installed by AESSEAL® within 24 hours in March 2017.

The performance of the CAPI™ Type A seal and API Plan 53B system exceeded the customer's expectations with the trial being a complete success.



Investment

Over 7% of annual sales revenue has been reinvested in R&D over several decades. This has almost certainly led to the most advanced range of sealing technology available globally.

With ongoing failures on the Ethylhexyl Acrylate scrubber pumps, a major oil storage facility operator gave AESSEAL® the opportunity to resolve the issue.

After investigating the current installation, AESSEAL® determined that the original sealing solution which had a MTBF of just one month had not been correctly specified. AESSEAL® recommended changing the competitor's seal and system to the AESSEAL® DISP™ dual seal with an SWFF™ Plan 53A seal support system.

AESSEAL® initially upgraded two pumps in August 2015, these systems have run fault free for over two years and, consequently, the facility operator has asked AESSEAL® to upgrade the rest of the EA scrubber pumps. The storage facility operator has high demand for turnaround of product in their facility and cannot afford unnecessary downtime. To meet this requirement, AESSEAL® have defined a small range of solutions that are suitable for the applications found on site, thereby providing the best possible lead times for solutions that have been proven to improve reliability.



Improve reliability without modifying your existing equipment

AESSEAL® has made an enormous investment in modular design which includes custom-engineered specials. For you the customer, this means a value-for-money solution and the best on-time delivery performance in the industry. AESSEAL® uses 9 and 11-axis machine tools, each of which has over 300 tool positions, so they can supply your engineered special on demand.

Global

Customer service is provided from 230 locations in 104 countries, including 9 manufacturing and 58 repair locations, with more than 300 customer service representatives who visit industrial plants every day.

Alaska

A customer in Alaska asked us to undertake repair and API 617 testing of OEM gas seals on a variety of their compressors. AESSEAL® achieved this in less than eight weeks from commission to completion.

UK

For this remote customer in Aberdeen, AESSEAL® designed, manufactured and delivered engineered high pressure seals to replace obsolete OEM seals for its main oil line export pumps – all within 48 hours.

Spain

A hot oil main pump was previously failing every 6-12 months. AESSEAL® replaced the competitor seal with AESSEAL® design CAPI™ C Dual which has been running for two years + without failure.



Chile

A customer near Santiago has a large 16x14 cyclone feed pump that consumed five cubic meters/hour (22 US gallons/minute) of flush water on the packing.

Poor water quality resulted in large quantities of product leaking past the packing and being lost down the drain. AESSEAL® supplied a 9.000” CDPH™ seal and SSE25 SWO2™ tank system that have been running for 18 months, saving 43,800 cubic meters (11.5 million US gallons) of water per year.

Mexico

For this customer in Mexico, AESSEAL® successfully sealed their bad actor hot naphtha vertical pumps. Using upgrades which included applying dual API 682 qualification tested technologies. This project was achieved without modifications to the pump machinery.

Middle East

For this customer in Saudi Arabia, AESSEAL® managed seal repair and a reliability program. As well as helping improve reliability, AESSEAL® reduced the total cost of ownership.

For further information and safe operating limits contact our technical specialists at the locations below.



Use double mechanical seals with hazardous products.

Always take safety precautions:

- Guard your equipment
- Wear protective clothing

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AESSEAL plc is certified to ISO 9001, ISO 14001, ISO 29001, ISO 37001, ISO 50001 and OHSAS 18001.

'Our purpose is to give our customers such exceptional service that they need never consider alternative sources of supply.'



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