



Sealmatic Delivers Its B750VK (API 682) Dual Mechanical Seals With API Plan 53B Seal Support System For A Refinery

Modern refineries operate as highly integrated and continuous processing facilities where crude oil is transformed into a wide range of valuable products such as LPG, naphtha, gasoline, diesel, aviation fuel and specialty streams. The refining process involves successive stages of separation, conversion and treatment, including atmospheric and vacuum distillation, hydrotreating, hydrocracking and other catalytic processes. Across all these units, large numbers of centrifugal and process pumps are employed to transfer hydrocarbons, intermediates and utilities at elevated pressures and temperatures. These critical pumps are required to operate continuously, often in demanding environments involving flammable, toxic and high-value fluids, where any unplanned shutdown or leakage can directly affect plant safety, environmental compliance and overall production efficiency.

Within this complex operating environment, the mechanical seal becomes a critical reliability and safety part of every rotating pump. In refinery services, mechanical seal failures are not merely maintenance issues; they can lead to hazardous releases, fire risks, product losses and costly downtime. For this reason, refinery operators increasingly specify engineered dual mechanical sealing solutions designed in accordance with API accepted standards and supported by reliable seal support systems.

To meet these stringent requirements, Sealmatic delivers its B750 VK dual mechanical seal designed in compliance with API 682 for a refinery application along with the API Plan 53B seal support system.

| Operating Parameters Of Type B750VK Dual Mechanical Seals | | | | | | | | | |
|---|------|---------------|------------------|---|--|--|----------------|------------------|-----------------------|
| Mechanical Seal Type | RPM | Media | Temperature (°C) | Stuffing Box Pressure (kg/cm ²) | Suction Pressure (kg/cm ²) | Discharge Pressure (kg/cm ²) | Viscosity (cP) | Specific Gravity | API 682 Configuration |
| B750VK | 1480 | TREATED WATER | 63°C | 4.3 kg/cm ² | 0.1 kg/cm ² | 6.2 kg/cm ² | 0.811 | 1.012 | 3CW – BB |
| B750VK | 2978 | SKIMMED OIL | 63°C | 5.73 kg/cm ² | 0.1 kg/cm ² | 25.4 kg/cm ² | 0.811 | 1.012 | 3CW – BB |

As per the above-mentioned operating parameters. The mechanical seals type B750VK Dual seal was engineered and manufactured specifically for a refinery application. Type B750VK Dual seal configuration is engineered to provide a robust and stable sealing arrangement suitable for a wide range of hydrocarbon services and demanding operating conditions.

Sealmatic Dual Mechanical Seal Type B750VK For Refinery Application

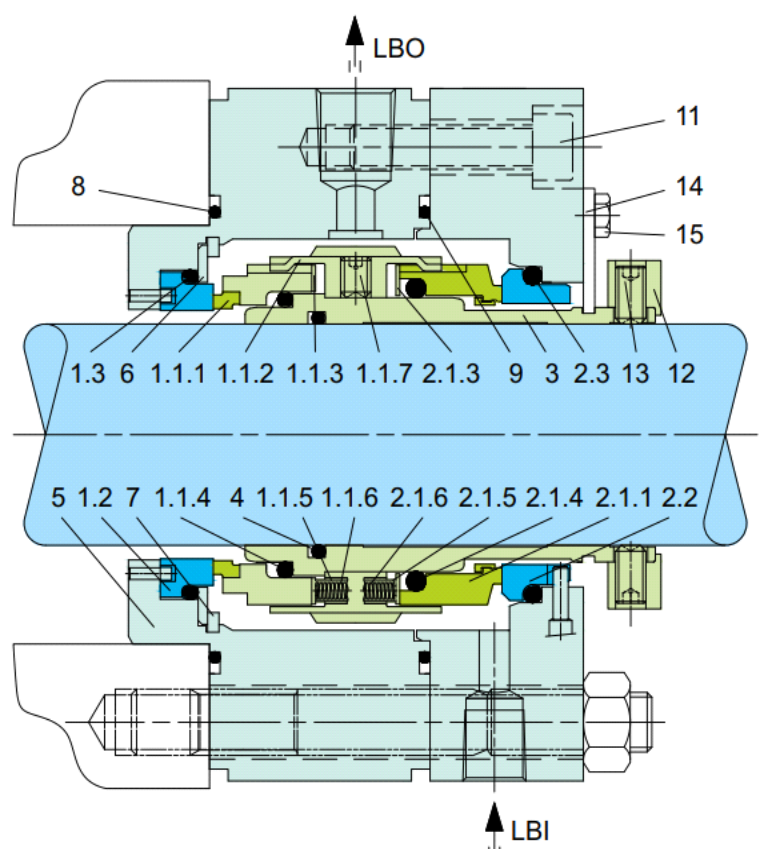
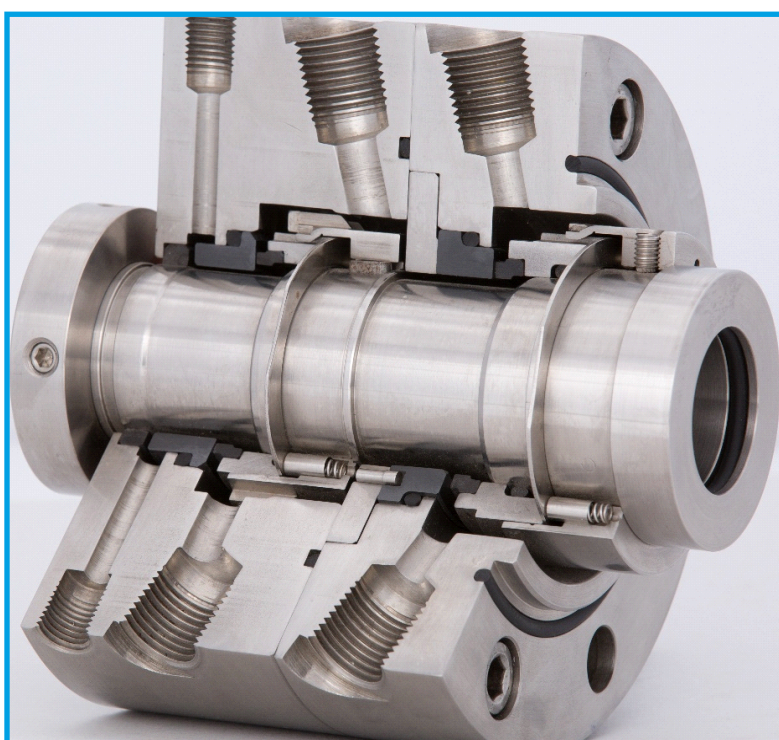
Type B750VK seal incorporates a back-to-back dual seal arrangement that creates a pressurized barrier between the process fluid and the atmosphere. The said mechanical seal is balanced and designed to operate independently of the direction of shaft rotation, allowing consistent performance in variable operating scenarios. Type B750VK is also engineered to accommodate reverse pressure and demanding duty conditions typically encountered in refinery and petrochemical pumping services, making it a dependable solution for highly volatile and hazardous fluids.

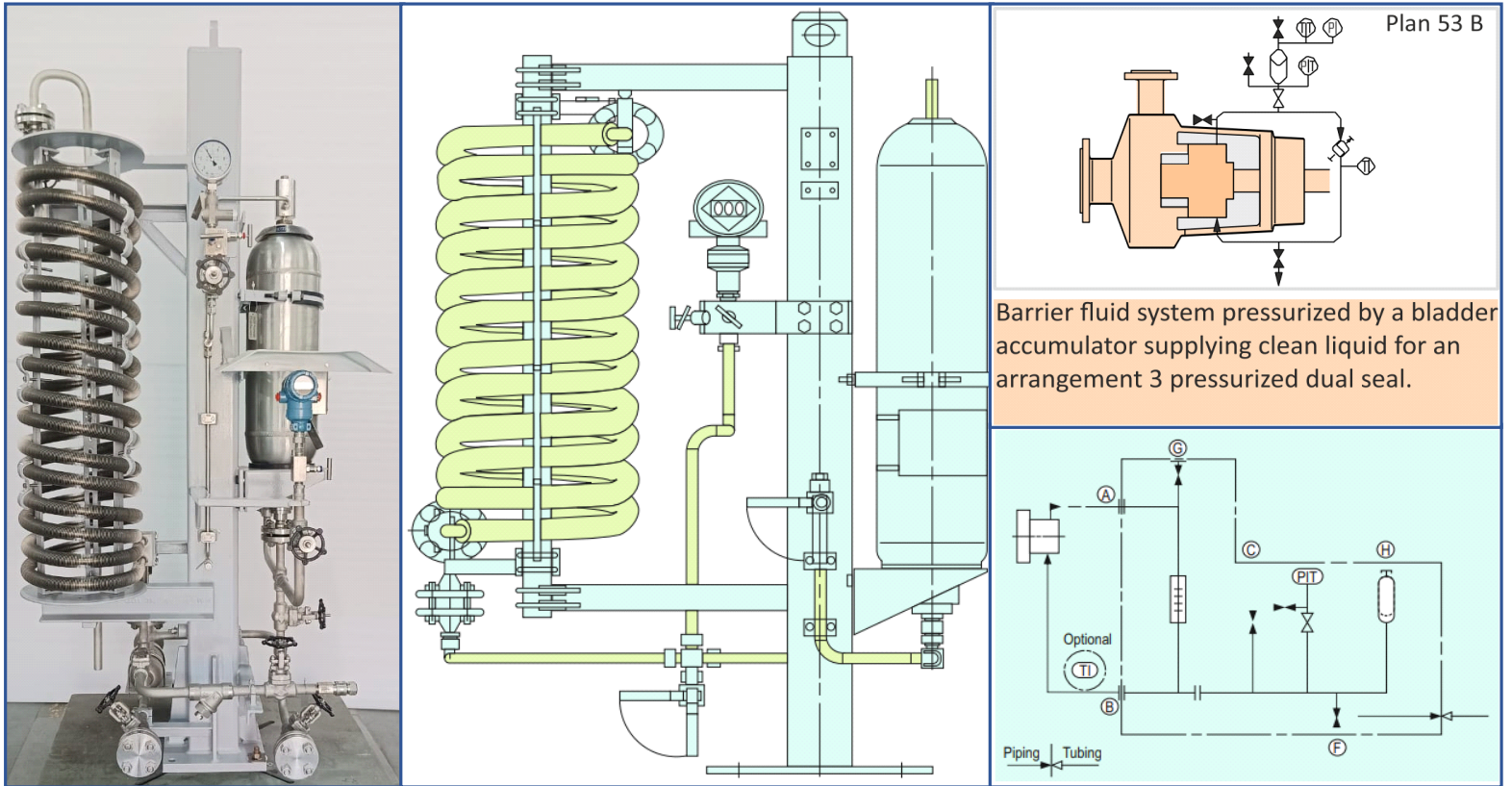
Technical Features of Type B750VK Dual Mechanical Seal

- Can handle extensive applications in various temperatures and pressures
- Versatile in design to fit various seal chambers
- Material of construction available in special metallurgy
- Special torque transmission design for high performance
- Operation reliability due to rugged metal torque transmission at the rotating seal face
- Pumping device available for increased efficiency in circulation
- Rotary unit with multiple springs.

Performance Capabilities of Type B750VK Dual Mechanical Seal

- Shaft diameter: d = 20 ... 110 mm (0.79" ... 4.33")
- Pressure: p1 = ... 42 bar (609 PSI)
- Temperature: t = -40 °C ... +176 °C (-40 °F ... +350 °F)
- Sliding velocity: vg = 23 m/s (76 /s)
- Axial movement: d ≤40 mm ±1.0 mm, d >40 mm ±1.5 mm





In a refinery environment, however, the performance of a dual mechanical seal is closely linked to the quality and stability of the supporting seal support system. For dual seals operating in Arrangement 3, a pressurized barrier fluid system is required to maintain a clean, controlled and stable environment for the seal faces. In this application, Sealmatic has supplied a robust API Plan 53B seal system to support type B750VK dual mechanical seal and ensure reliable long-term operation under critical service conditions.

API Plan 53B is a pressurized barrier fluid support system specifically developed for dual mechanical seals employed in severe and hazardous duties. The fundamental principle of this system is to maintain a clean barrier fluid at a pressure higher than the pressure inside the seal chamber. The core of the API Plan 53B system is a bladder accumulator that is pre-charged with nitrogen gas. The bladder physically separates the pressurizing gas from the barrier liquid, thereby preventing gas entrainment in the circulating fluid. As the barrier fluid is filled into the system, the bladder is compressed and a stable operating pressure is established throughout the seal support circuit.

During pump operation, heat generated at the mechanical seal faces is absorbed by the circulating barrier fluid. This heated fluid is routed through the external cooling surfaces of the system, where heat is dissipated to the surrounding atmosphere through natural convection. The cooled barrier fluid then returns to the seal chamber, maintaining a stable thermal and lubrication environment for both sets of seal faces. A key advantage of the API Plan 53B configuration is its ability to maintain a consistent and controlled barrier pressure throughout the operating cycle.

Proper commissioning and venting of the API Plan 53B system are essential for achieving its intended performance. All trapped air and gas pockets must be removed during system filling to ensure uninterrupted circulation and effective heat removal. When correctly installed and commissioned, the system provides smooth circulation of the barrier fluid, reliable cooling and consistent pressure control for the dual seal arrangement. The API Plan 53B systems supplied for this project consist of 4 system designed with natural draft cooling (double spiral fins). With bladder accumulator pressurization and efficient air cooling, the system ensures safe operation, environmental protection and extended mechanical seal life in critical application.

The integration of Sealmatic type B750VK dual mechanical seal with API Plan 53B seal support system delivers a comprehensive mechanical sealing solution for demanding refinery application. The combination ensures effective containment of hazardous process fluids, stable lubrication and cooling of seal faces and long-term operational reliability. Sealmatic reinforces its commitment to supplying robust, API compliant and application focused solutions for the oil, gas and refining industries, thus; achieving safer operations, higher reliability and extended service life of critical rotating equipment.

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