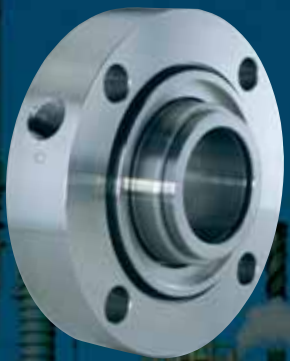
FLUITEN

A strong link of your system

API 682

FLUITEN SEALS RANGE



The API 682 standard is the directive document which specifies materials, requirements, and qualification tests for mechanical seals and systems to be used in refineries and petrochemical plants. In 1993 Fluiten began the research for developing a complete new seal range complying with the API 682 standard. Personnel from research, engineering, quality control and other company departments have directed their efforts to provide a product capable of giving performance superior to any other seal manufacturer. Fluiten applied its 40 years design and manufacturing experience to achieve this important target, keeping in priority the most important issues driving the mechanical seal technology and approaching the development with a clean mind. All while using the latest materials technology associated to finite element analysis and carved faces.

Offering:

- High reliability
- Long life
- Low operating cost

Member of CISQ Federation
RINA
ISO 9001:2000
Certified Quality System

API 682 STANDARD COMPLIANCE

THE PURPOSE OF THIS NORMATIVE IS:

- Extend seal life up to 36 months MTBF uninterrupted service
- Provide safety in hazardous duties
- Comply with emission levels regulations
- Standardization using the cartridge concept

API 682 establishes requirements for mechanical seals ,sealing systems auxiliaries and instrumentation. Scope of the directive is to cover the following operating limits:

Centrifugal pumps for shaft sizes from 20 to 110 mm (0.875" to 4.500")

Temperature from -40°C to + 400°C (- 40 F to 750 F)

Pressures up to 42 bar A (615 psia)

API 682 has established three distinct seal categories as summarized below:

Category I: Seals are intended for use in non-ISO 13709 pump seal chambers, preferably meeting the dimensional requirements of ASME B73.1, ASME B73.2 and ISO 3069.

Category II: Seals are intended for use in seal chambers meeting the chamber envelope dimensional requirements of ISO 13709.

Category III: Provides the most rigorously tested and documentated seal design. It is required that the entire seal cartridge is qualification tested as an assemby in the required fluid. They meet the seal chamber envelope requirements of ISO 13709 (or equal).

Not only does the API 682 describe how seals are to be manufactured, it also comes to the aid of the technician that has to identify the most indicated seal type for a certain application.

The above directive specifies materials and arrangements for three basic types of cartridge seals:

Type A Rotary Pusher Seal
Type B Rotary Bellows Seal
Type C Stationary Bellows Seal

And classifies TYPES in three arrangements:

Arrangement 1 Single
Arrangement 2 Dual Unpressurized (Ex "Tandem")
Arrangement 3 Dual Pressurized (Ex "Double back-to-back")

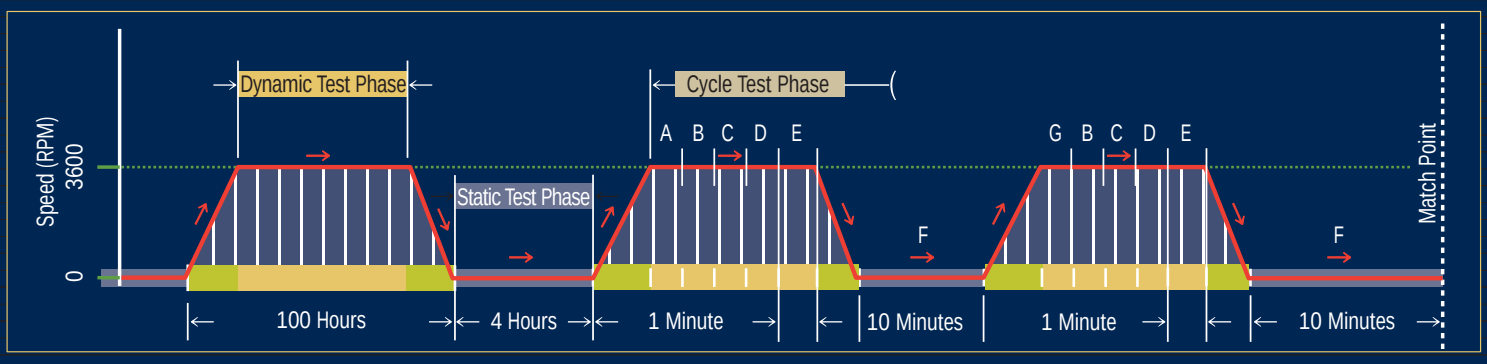
Where:
Dual seals (previously indicated as Tandem or as Double back-to-back seals arrangements) use a seal chamber for both operation modes and can utilize pressurized or non pressurized lubricating fluids. The lubricating fluid is circulated inside dual mechanical seals to completely isolate the pump process liquid from the environment.
The barrier fluid (previously applied to typical Dual Pressurized seal operations) is introduced at a pressure that is always higher than the process pressure being sealed.
The buffer fluid (previously applied to typical Dual Unpressurized seal operations) is used as a lubricant or buffer inside dual mechanical seals at a pressure that is always lower than the pump process pressure.

API 682 SEALS TESTING

API 682 has also determined specific parameters for seals testing; API seals are therefore predetermined in terms of configurations, materials, manufacturing, application/selection and testing.
To perform these test cycles Fluiten has constructed a test rig at its facility in Milan. The test simulates pressure, velocity and temperature conditions at required levels while continuously monitoring critical performance parameters such as seal face pressure, friction torque, and fluid and seal face temperature in order to achieve the max seal life projection and less energy consumption.
Test certificates for each type of classified seal are available upon request.

A CHECK-LIST FOR PERFECTION

- Cartridge arrangement
- Inside mounted
- Reverse balancing
- Robust retaining plates
- Non sparkling floating throttle bushing
- Distributed radial flushing (Multi-point injection)
- Solid faces and homogeneous material
- Robust sleeve design
- Sleeve with positive axial positioning and drive
- Hardened set screws
- Minimized heat generation
- Zero emission compliance
- Low, Medium and High Pressure face design

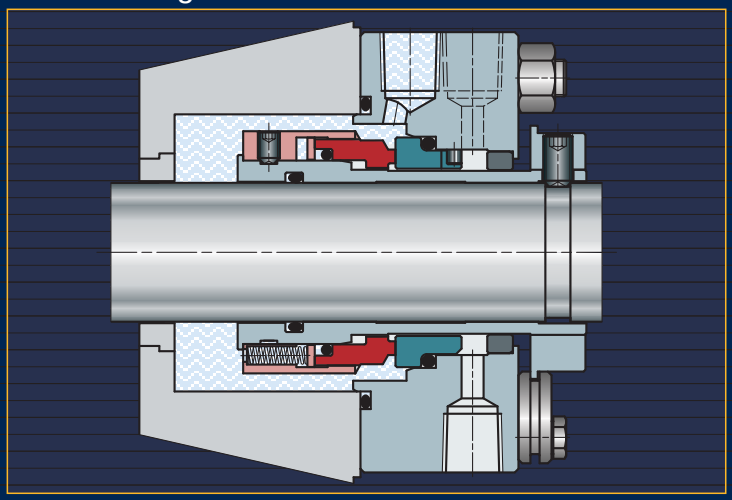


FLUITEN SEALS ARE PERFECT ON PURPOSE, NOT BY CHANCE

CATEGORY I TYPE A

These seals are intended for stuffing boxes according to ISO 3069 - H (cartridge arrangements). For ISO 3069 (component seals range) please refer to the FLUITEN standard program according UNI EN 12756. All seals are available in A/B types (pusher and bellows). Thanks to the simplified construction these seals are the best option for general purposes duty and retrofit for all pump models.

Arrangement 1 FLUITEN B M 8 S

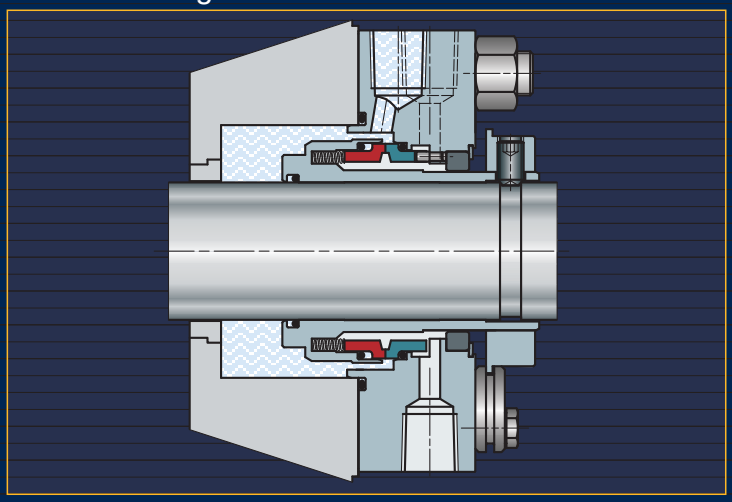


1CW-FX Contacting single wet seal with a fixed throttle bushing

FEATURES & BENEFITS

- Simplified construction
- Fixed safety bush
- Fluoroelastomer (FKM), Perfluoroelastomer (FFKM), Fluigam option for dynamic O-Ring
- Monolitic faces - alloy C276 springs
- Standard 316 SS gland, sleeve and other metal parts
- Special alloy options for metal parts
- Hardened steel set screws
- Engineered high pressure design (up to 42 bar)

Arrangement 1 FLUITEN C 8 S



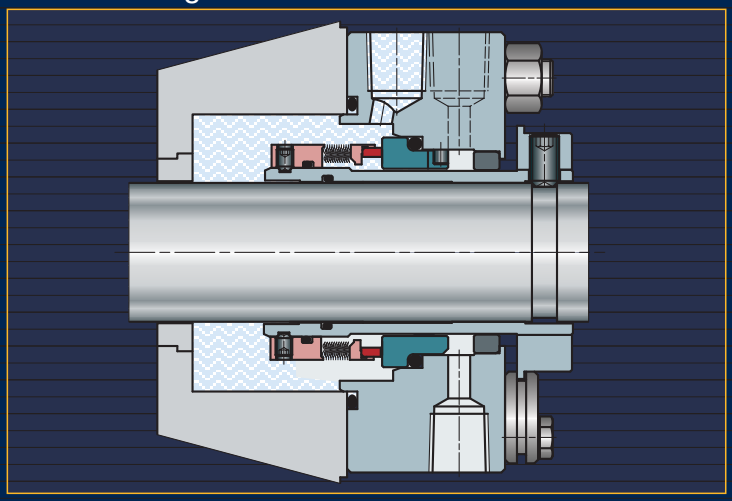
1CW-FX Contacting single wet seal with a fixed throttle bushing

FEATURES & BENEFITS

- Modular construction - fixed safety bush
- Thick sleeve
- For fluids having high viscosity and solids content
- Monolitic faces - not wetted springs
- Double balancing line
- Standard 316 SS gland, sleeve and other metal parts
- Special alloy options for metal parts
- Hardened steel set screws
- Integrated pumping device (dual seals)
- Also available arrang. 2 and 3 (**C8T-C8D-C8L**)

CATEGORY I TYPE B

Arrangement 1 FLUITEN T R 8 S



1CW-FX Contacting single wet seal with a fixed throttle bushing

FEATURES & BENEFITS

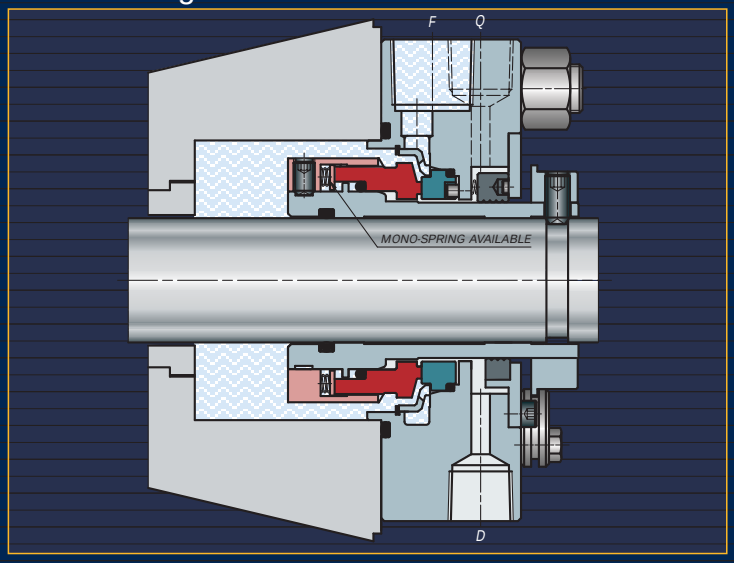
- Rotating bellows, o-ring secondary seals
- Mating Faces: (RB SiC or SSSiC) Silicon carbide / premium grade blister resistant carbon
- Fluoroelastomer (FKM), Perfluoroelastomer (FFKM)
- Standard 316 SS gland, sleeve and other metal parts
- Special alloy options for metal parts
- Hardened steel set screws
- Also available arrang. 2 and 3 (**TR8T-TR8D**)

OPERATING LIMITS SIZE: 20/110 mm | SPEED: 23 m/sec | PRESSURE: 22 bar | TEMPERATURE: -40°/176°C

CATEGORY II & III TYPE A

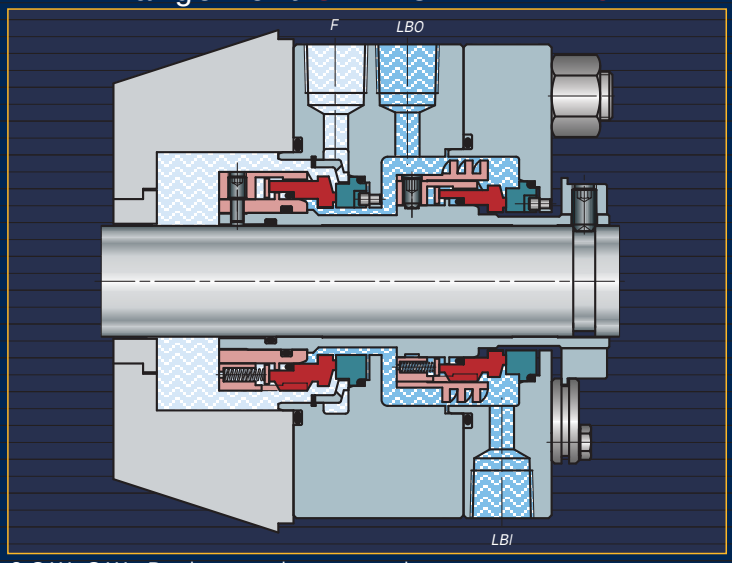
Seals provide a total sealing solution for all API 682 - 610 and high duty processes. They are supplied in cartridge configuration; single, dual and single + dry-running containment seal. All these arrangements with proven track records in meeting emission regulations. Face design are engineered for low, medium and high pressures to withstand all operating conditions on hydrocarbon duties. The outer seal on dual arrangement is provided with a high performance pumping ring to assure sufficient heat removal. The double balancing line provides this seal with the possibility of acting as double pressurized or in tandem mode.

Arrangement 1 FLUITEN B M 6 S



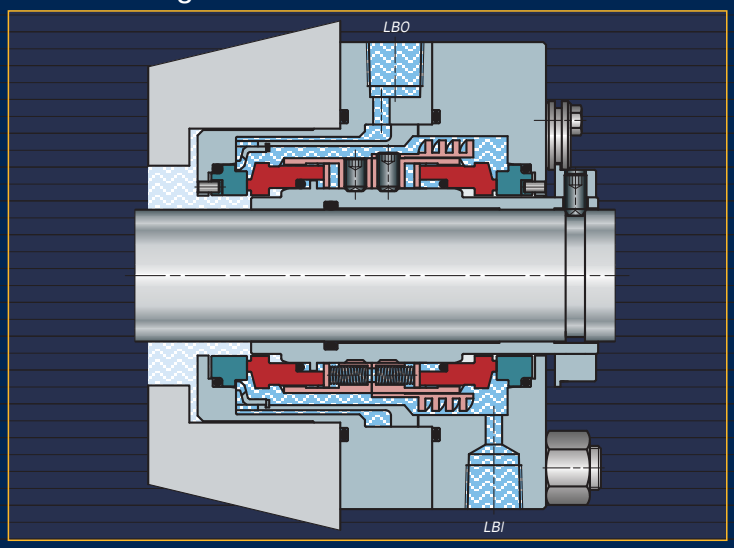
1 C W - F X Contacting single wet seal with a fixed throttle bushing
1 C W - F L Contacting single wet seal with a floating throttle bushing

Arrangement 2 FLUITEN B M 6 T
Arrangement 3 FLUITEN B M 6 D



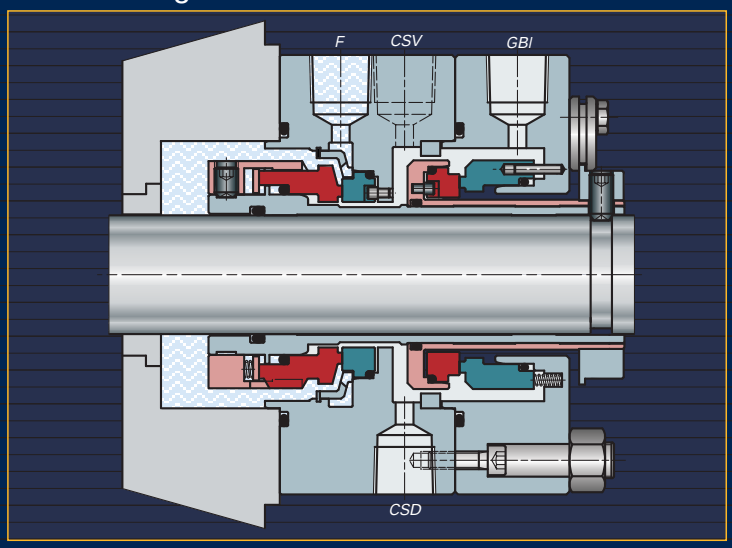
2 C W - C W Dual contacting wet seals
3 C W - F B Two contacting wet seals in a face-to-back configuration

Arrangement 3 FLUITEN B M 6 B



3 C W - B B Two contacting wet seals in a back-to-back configuration

Arrangement 2 FLUITEN B M 6 L



2 C W - C S Contacting wet inner seal with dry-running containment

FEATURES & BENEFITS

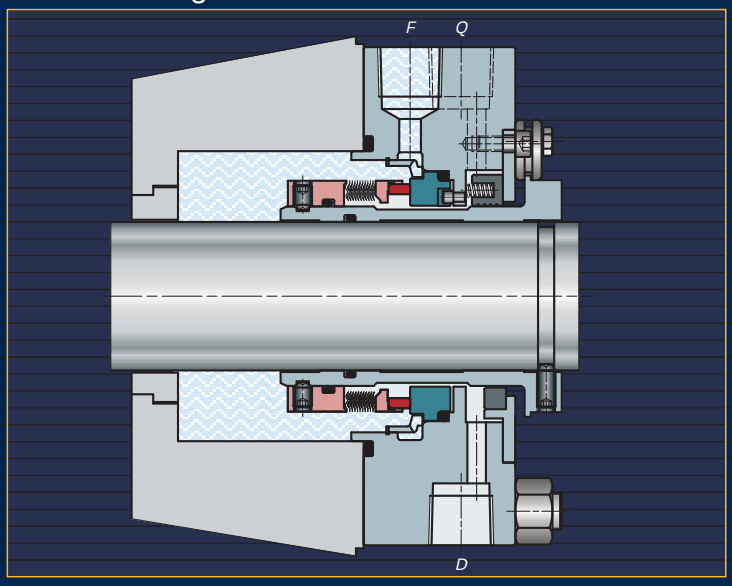
- Rotating flexible element, multisprings, o-ring secondary seals
- Mating Faces: (RB SiC or SSSiC) Silicon carbide / premium grade blister resistant carbon
- Fluoroelastomer (FKM), Perfluoroelastomer (FFKM)
- Double balancing line, axial stop to prevent reverse pressure seat displacement
- Monolitic faces - alloy C276 springs
- Standard 316 SS gland, sleeve and other metal parts
- Special alloy options for metal parts
- Hardened steel set screws
- Multipoint flushing connection
- Floating or fixed bushing (Optional for dual seals)
- High performance pumping ring for API PLAN 23-52-53A-53B

OPERATING LIMITS SIZE: 20/110 mm | SPEED: 23 m/sec | PRESSURE: 42 bar | TEMPERATURE: -40/176 °C

CATEGORY II & III TYPE B

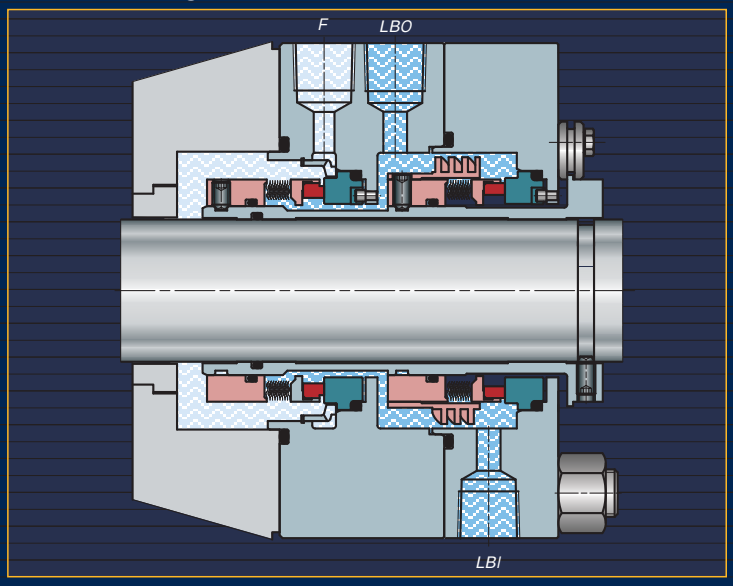
Rotating welded metal bellows seals presenting the advantage of fitting on straight shafts or sleeves and eliminating the fretting corrosion that normally is affecting the pusher type seals. A further advantage is that bellow rotation provides itself a “self-cleaning” effect that prevents solids from being retained in the bellows’ convolutions. It is the ideal seal for low/medium temperature hydrocarbons, corrosive chemicals, liquid lubricants, water treatments, etc.

Arrangement 1 FLUITEN TR6S



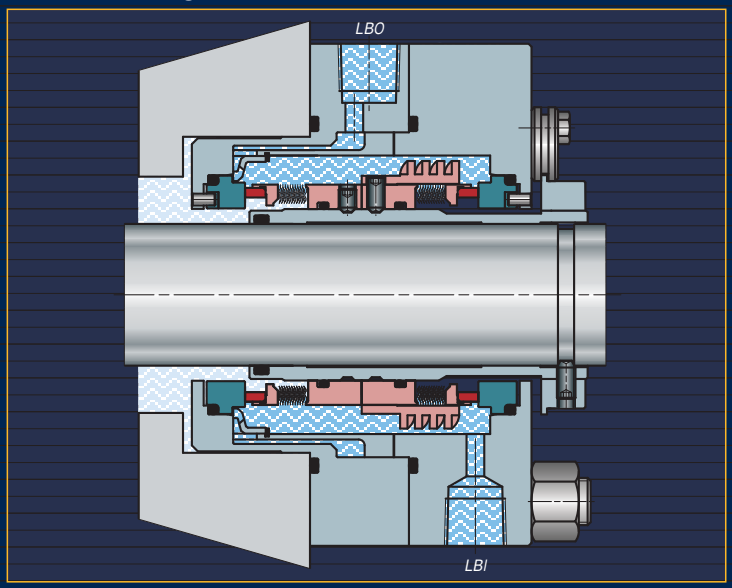
1CW-FX Contacting single wet seal with a fixed throttle bushing
1CW-FL Contacting single wet seal with a floating throttle bushing

Arrangement 2 FLUITEN TR6T
Arrangement 3 FLUITEN TR6D



2CW-CW Dual contacting wet seals
3CW-FB Two contacting wet seals in a face-to-back configuration

Arrangement 3 FLUITEN TR6B



3CW-BB Two contacting wet seals in a back-to-back configuration

FEATURES & BENEFITS

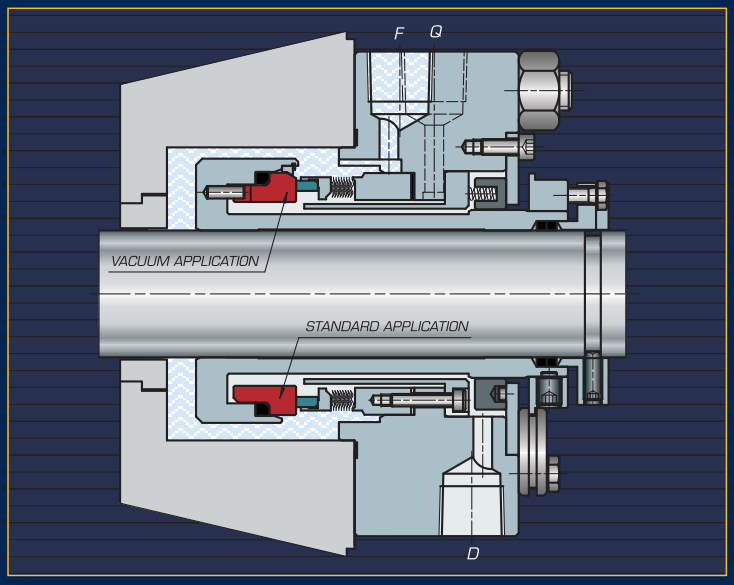
- Rotating bellows, o-ring secondary seals
- Mating Faces: (RB SiC or SSSiC) Silicon carbide / premium grade blister resistant carbon
- Fluoroelastomer (FKM), Perfluoroelastomer (FFKM)
- Axial stop to prevent reverse pressure seat displacement
- Standard 316 SS gland, sleeve and other metal parts
- Special alloy options for metal parts
- Hardened steel set screws
- Multipoint or single point flushing
- Floating or fixed bushing (Optional for dual seals)
- High performance pumping ring for API PLAN 23-52-53A-53B
- Double play bellows available for pressures up to 42 bar

OPERATING LIMITS SIZE: 20/110 mm | SPEED: 23 m/sec | PRESSURE: 22 bar | TEMPERATURE: -60/176 °c

CATEGORY II & III TYPE C

Stationary welded metal bellow seal aimed primarily at sealing in high temperature hydrocarbons, heat transfer fluids and cryogenic applications. These arrangements foresee stationary bellows in order to accept speeds and vibrations more than with rotating bellows. Shaft misalignment effects are also minimized providing a steadier film between the seal faces. Bellows' material is suitable to the most common corrosive chemicals dissolved in refinery process streams.
The TS6S has reverse pressure capability and is provided with a retained stationary face.

Arrangement 1 FLUITEN TSHS



1CW-FL Contacting single stationary bellows wet seal with a floating throttle bushing and steam quench device

FEATURES & BENEFITS

- Stationary bellows, flexible graphite secondary seals
- Mating Faces: (RB Sic) Silicon carbide / premium grade blister resistant carbon
- Alloy 718 bellows
- 316 SS gland, sleeve and other metal parts
- Bronze anti coking device
- Hardened steel set screws
- Graphoil gaskets
- Floating bushing for steam quench
- Double play bellows available for pressures up to 42 bar

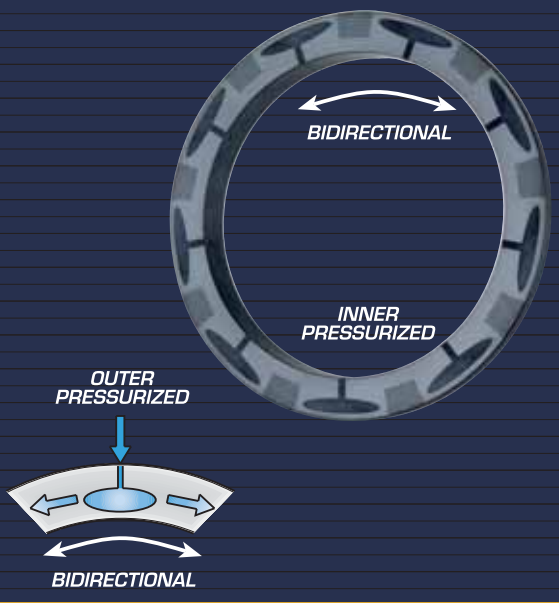
Note: Rotary bellows (engineered FLUITEN TRHS and TRHT/D) available - see our technical manual SEM001 ENG

OPERATING LIMITS | SIZE: **20/110**mm | PRESSURE: **22**bar | TEMPERATURE: **-80/400**°C

GROOVE FACES

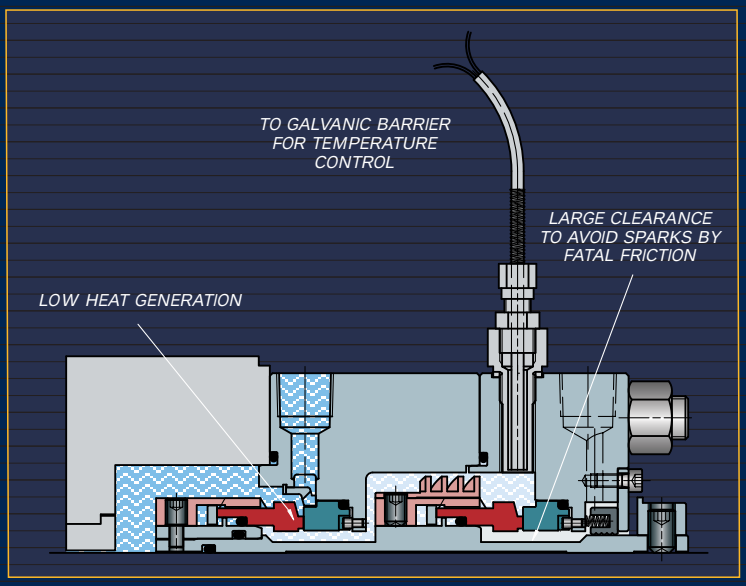
The technological development of seal rings with hydrodynamic groove face provide an efficient lifting effect eliminating the friction and the connected heat load.
The FLUILIFT technology is applied on high vapour pressure hydrocarbons either in single or dual arrangement and also for hot water and overheated steam.
All API configurations are suitable for the application of this technology. FLUITEN has "in house know how" and utilize this advantage to solve the most stressing applications in term of speed, pressure associated to the most critical media.

TYPICAL FACE GROOVES



ATEX COMPLIANCE (94/9/CE)

The API 682 FLUITEN seals range are certified according the ATEX directive 94/9/CE (TÜV) which has defined the European requirements for equipment installed in critical potential explosive areas.
A declaration of conformity and a specific instruction manual can be supplied on demand.
This documentation complete the equipment certification required for the duty validation.
For high risk applications Fluiten can provide double mechanical seals lubricated and monitored by a thermocouple which has the probe located inside the stationary rings or in contact with the barrier fluid to have direct temperature relief.



SERVICE SOLUTIONS

The Fluiten service department , independent from the production process, offer a fast, flexible and high quality assistance for any necessity.
During the repair process are also considered up grading evaluation to make the seals compliant to the recent environmental rules and using the present superior material technology.
High experienced technicians operates according the quality manual which define the level of repair to the initial manufacturing tolerances and performances.

Customer and After sales service for assistance and technical support tel. +39 02 3394033.1 or contact us by info@fluiten.it or www.fluiten.it

FLUITEN'S STAFF, REPRESENTATIVES AND FIELD TECHNICIANS ARE WILLING TO ASSIST YOU WHEREVER YOU ARE

FOR MORE INFO ASK FOR TECHNICAL MANUAL SEM001 ENG

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