P848 Series

MECHANICAL SEALS

DESCRIPTION

The P848 series is a high temperature single/dual metal bellows cartridge seal intended to provide excellent sealing performance general services, primarily on high temperature application for petrochemical and chemical industry. P848 particularly exhibits high performance in the operation of critical process fluids of hydrocarbon, boiler feed water, sour gas, propane and butane, non-flashing hydrocarbon and flashing hydrocarbon. The improvements in design reliability and robustness are made possible by the utilization of sophisticated Finite Element Analysis (FEA) Engineering Software. These features are further verified by the usage of ProEight's high-end testing equipment, the patented mechanical seal static tester – AccuTEST® and mechanical seal dynamic tester – AccuDYN® (Patent Pending).

The adoption of modularity concept has made P848 series even more versatile. Coupled with added interchangeable feature, P848 series seals are able to fit in various conditions, wider range of operating pressures, temperatures and process fluids. This concept ensures that the P848 series seal requires only minimum change-out on its seal face to suit these conditions, eliminating the need to redesign a completely different mechanical seal configuration. To cope with temperature sensitive environment, Low-temperature Inducing Face, ARCAF® is designed for this particular need. ARCAF® can be interchanged with other RST Standard Faces to suit other different operating conditions.

INDUSTRIAL APPLICATION

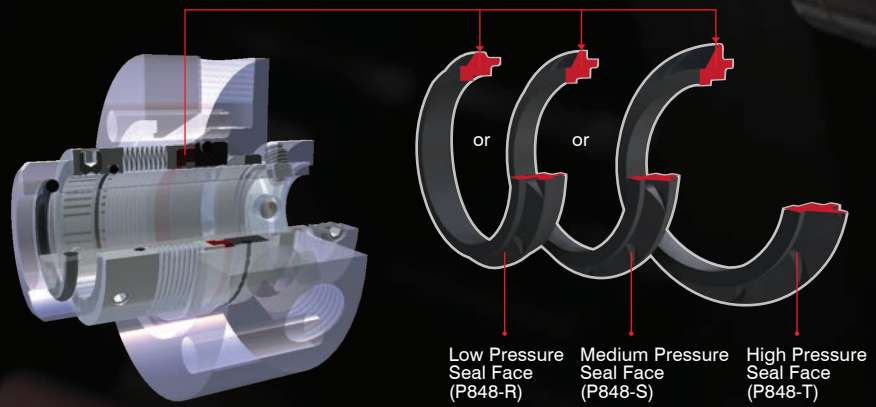
- Oil & Gas Production
- Petroleum Refining
- Pipeline
- Pulp & Paper

SEAL APPLICATION

- Centrifugal Heavy Duty Pumps
- Centrifugal API Process Pumps
- Centrifugal General Purpose Pumps
- Positive Displacement Pumps

DESIGN OVERVIEW

- Meet API682 technical design configurations and requirements
- Materials Selection and Design is in accordance with API682 Standard
- RST Design Optimization for seal face design
- Flushing Flow pattern is optimised around seal faces, removing trapped vapour
- High efficiency buffer circulation system



(MODULAR TYPE SEAL FACE DESIGN)

RST DESIGN PHILOSOPY

Advanced FEA Program for Design Optimization

ProEight in-house FEA programs, SIGMA-FEA and CELC-FEA combined with ANSYS were used extensively to design the RST mechanical seals. Steady state and transient conditions coupled with various possible sealing environment gave a clear overview on the mechanical seal's performance. These software programs analyse combined seal distortion due to pressure, temperature, stress distortion and face loadings.

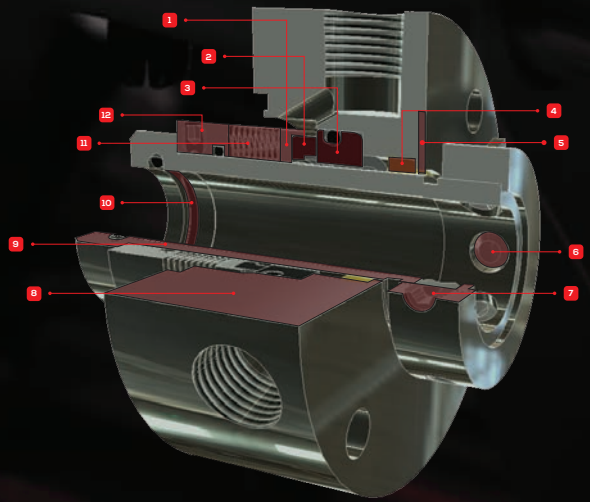
Internal Compression Unit

The main component of the seal is interchangeable to suit wide range of seal application.

PERFORMANCE CAPABILITIES

Temperature	:	-40°C to 425 °C / -40 °F to + 500 °F
Pressures	:	Up tp 20 bar g/300 psig
Speeds	:	Up tp 50 m/s / 10,000 fpm

SEAL PARTS

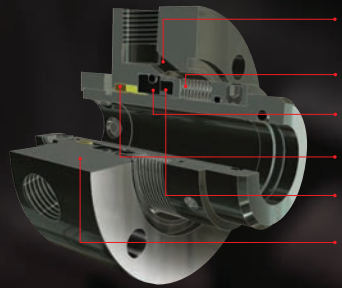


1. Thrust Ring
2. Seal Face
3. Seat
4. Throttle Bushing
5. Bushing Retainer
6. Set Screw
7. Drive Collar
8. Flange
9. Shaft Sleeve
10. O-Ring
11. Spring
12. Spring Retainer

MATERIAL SPECIFICATION

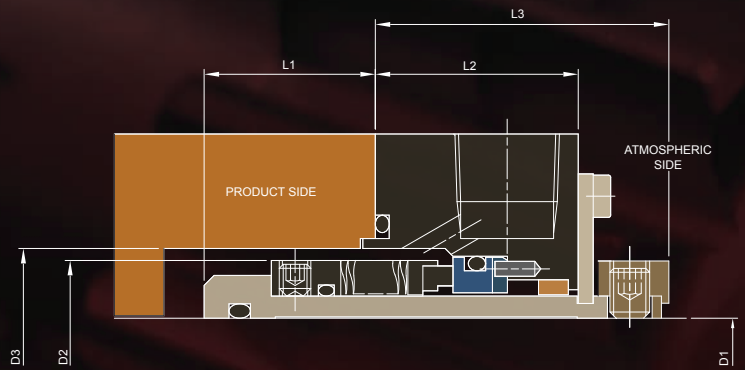
SEAL COMPONENTS	MATERIALS	
Description	Standard	Custom
Seal Face	Resin Impregnated Carbon	Tungsten Carbide (WC) Alpha Sintered Silicon Carbide (α-SiC) Antimony Impregnated Carbon Reaction Bonded Silicon Carbide (RbSiC)
Seat	Reaction Bonded Silicon Carbide (RbSiC)	Alpha Sintered Silicon Carbide (α- SiC)
Drive Collar Thrust Ring Set Screw Shaft Sleeve Drive Collar Throttle Bushing Flange Bushing Retainer	Stainless Steel 316L (UNS S31603) Stainless Steel 304L (UNS S30403)	Duplex (UNS S31803) Hastelloy© C-276 (UNS N10276) Bronze Titanium Alloy (UNS R56401)
Spring	Stainless Steel 316L (UNS S31603)	Hastelloy© C-276 (UNS N10276) Stainless Steel 304L (UNS S30403)
O-Ring	Fluoroelastomers - Viton© (FKM)	Amine-Resistant Perfluoroelastomer (FFKM) Low Temp Nitrile Butyl Rubber (NBR) Teflon Encapsulated Viton (VMQ) Ethylene Propylene Diene Monomer (EPDM)

DESIGN FEATURES

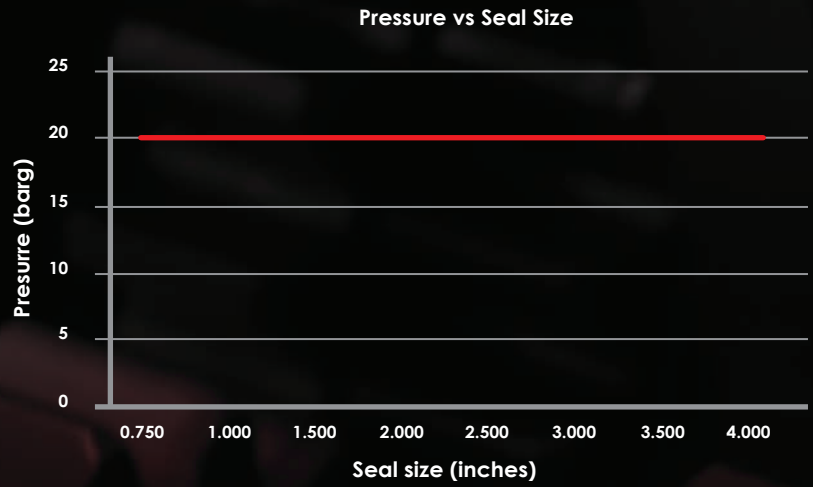


- High flow pattern and distributed flush system
- Uniform-load Multi-spring compression unit
- RST Optimized Seal Face Design
- Emission Restrictive Throttle Bushing
- Low-temperature including face (ARCAF®)
  (subject to design requirements & compatibility)
- Bolted Auxiliary Gland

DESIGN DRAWING



PERFORMANCE CURVE



Metal bellows pressure rating is 20 bar g and temperature rating is 200 ºC across all seal sizes from 0.750" up to 4.000".

DIMENSIONAL DATA

Seal Size *	D1	D2	D3	L1	L2	L3
0190	14.27	37.01	47.00	25.00	40.00	55.00
0206	15.87	37.01	47.00	25.00	40.00	55.00
0222	18.00	37.01	47.00	25.00	40.00	55.00
0238	19.05	37.01	47.00	25.00	40.00	55.00
0254	20.00	37.01	47.00	25.00	40.00	55.00
0270	22.60	42.85	53.90	25.00	40.00	55.00
0285	22.60	42.85	53.90	32.30	45.00	63.00
0317	25.70	46.02	57.15	32.30	45.00	63.00
0349	28.90	49.20	60.32	40.30	45.00	63.00
0381	32.10	52.37	60.32	40.30	45.00	63.00
0412	35.30	55.55	63.50	40.30	45.00	63.00
0444	38.50	58.72	69.85	40.30	45.00	63.00
0476	41.60	61.90	73.02	48.20	45.00	63.00
0508	44.80	65.07	76.20	48.20	45.00	63.00
0539	48.00	68.25	79.37	48.20	45.00	63.00
0571	51.20	71.42	79.37	48.20	45.00	63.00
0603	54.30	74.60	85.72	48.20	45.00	63.00
0635	57.50	80.95	92.07	48.20	45.00	63.00
0666	60.70	84.12	92.07	48.50	46.30	64.50
0698	63.80	87.30	95.25	48.50	46.30	64.50
0730	67.00	92.08	101.60	48.50	46.30	64.50
0762	70.20	95.25	104.78	48.50	46.30	64.50
0793	73.40	98.43	107.95	48.50	50.20	68.20
0825	76.60	101.60	111.12	48.50	50.20	68.20
0857	79.70	104.78	114.30	48.50	50.20	68.20
0889	82.90	107.95	117.47	48.50	50.20	68.20
0920	86.10	111.13	120.65	48.50	50.20	71.20
0952	89.30	114.30	123.82	48.50	50.20	71.20
0984	92.40	117.48	127.00	48.50	50.20	71.20
1016	95.60	120.65	130.17	48.50	50.20	71.20

* All dimensions are in mm

D1 assumes a standard ISO tolerance for shaft (ISO286-2)

Fluid Type	Temperature Range		Weightage
	Min (°C)	Max (°C)	
Lubricating Fluid Light Hydrocarbon	60 81 101 121 161 181 201	80 100 120 160 180 200 220	1.00 0.96 0.90 0.84 0.80 0.65 0.62
Aqueous Solution	40	100	0.75

For further information, please consult our Tecnical Support Engineer.

NOTES:

1. The pressure weightages only confirm to seals with carbon primary rings. Hard face vs hard face combination seals are not applicable.
2. The listed temperatures are referred to single seal's product temperatures. For dual seals,the listed temperature are referred to the product fluids & buffer/barrier fluid's average temperature.

All specifications are based on extensive tests and our many years of experience. The diversity of possible applications means, however, can only served as guide values. We must be notified of the exact conditions of application before we can provide any guarantee for a specific case. Subject prior to change.