

Mechanical Gas Seals

Market Application Publication



Background:

To reduce the volume of gases containing volatile organic compounds leaking to atmosphere, environmental agencies have instituted regulations limiting VOC emissions.

Many large pumps or compressors contain mechanical gas seals that operate as non contacting, dry running seals. These seals isolate compressed gases containing VOC's from leaking to atmosphere. Mechanical gas seals are designed to perform with a wide variety of gases that can be harmful to workers and the environment. For example, the lubricating gas that is normally used to pressurize the seal is natural gas. A safer alternative to natural gas is dry, inert nitrogen gas which can be generated on site from standard compressed air at a very low cost.



Contact Information: Features and benefits:

Parker Hannifin Corporation
Filtration and Separation Division
242 Neck Road
Haverhill, MA 01835

phone 800 343 4048 or 978 858 0505
fax 978 556 7501

www.balstonfilters.com

- Continuous supply of dry N2 at selected purity
- Dependable, reliable and automatic operation
- Eliminates the need for natural gas for sealing
- Uses low pressure plant air supply and eliminates high pressure cylinders
- Built-in membrane air dryer is available
- Standard customer connections on cabinet models
- Designs available for hazardous locations
- Compact size affords easy shipping and installation



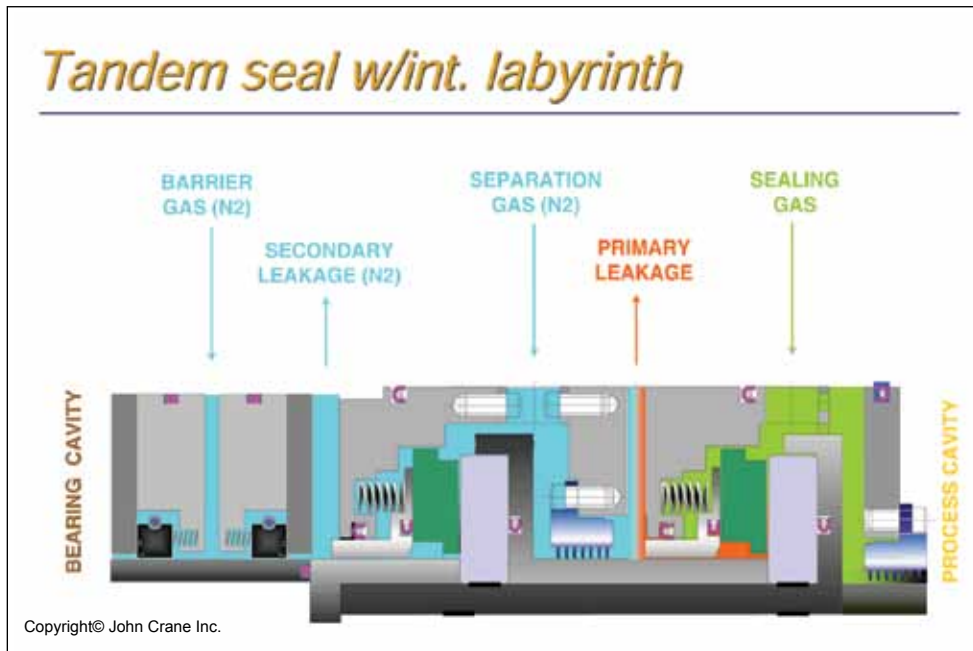
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Application/Case Study:

A major manufacturer of centrifugal gas compressors had received an order for several large systems for an overseas co-generation plant. In order to comply with emission regulations and maintain an absolutely tight seal to prevent natural gas from leaking from the mechanical seals, the seals had to be pressurized externally with a dry, inert gas.

The compressor was located in a hazardous location in the plant, so it was critical that the inert gas always be available to ensure nonflammable conditions as well as provide proper lubrication for the seals when the compressor was in operation, which was continuous day and night.

Nitrogen or inert gas was unavailable in this area of the plant, therefore the only reasonable option was generation of nitrogen on location. The only instrument air available was at 100 psig. The manufacturer needed a fail-proof system to protect against loss of plant air supply or electric power; a redundant system with back-up storage for 4 hours was specified. Only Parker could deliver on all requirements, designing and fabricating a cost-effective custom system that operated under all contingencies, giving the client total reliability and peace of mind. This customer has repeatedly specified Parker for his gas sealing needs. The quality, experience, and unmatched performance of Parker nitrogen systems makes them the perfect solution.



Custom Nitrogen features and benefits:

Parker Hannifin's reputation for building custom N2 generators for gas seal service is unparalleled in the industry. Some of these features, all supplied by Parker in the past, include:

- Redundant generators for 100% back-up capabilities
- PSA or membrane generators, at purities from 95-99.9+%
- Active/passive complete feed air compression systems
- Automatic N2 turndown designs for multiple gas sealing requirements
- Automatic high pressure storage vessels for back-up supply
- Integrated high pressure N2 boosters to recharge cylinders automatically
- Designed to exacting global customer specifications



100% Redundant membrane package with auto switch-over for hazardous environments



FB Cabinet model with back-up N2 cylinders



Model MB-600 Gas Seal unit



Parker Mono-bed PSA N2 generator



Performance Charts for Standard Cabinet Models:

Specifications:

Description	
Compressed Air Specifications	
Maximum Pressure	175psig to 188 psig (12 barg to 13 barg)
Temperature Range	60°F to 120°F (16°C to 49°C)
Dewpoint	-40°F (-40°C) pressure dewpoint or lower
Residual Oil Content	Trace
Particles	<.01 micron
Ambient Conditions	
Temperature	45°F - 110°F (7°C - 43°C)
Ambient Pressure	Atmospheric
Air Quality	Clean air without contaminants
Dimensions, Weight and Connections	
Consult factory; based on performance requirements	

Flow Rates:

Parker HiFluxx® Membrane Systems

Data based on variable feed air pressures at 68°F (20°C)

Nitrogen Flow rates (scfm) at 95% Purity*

Air Feed Pressure	FB Models						
	608-1	608-2	608-3	1508-1	1508-2	1508-3	1508-4
4 barg (58 psig)	3.0	6.0	9.0	6.6	13.2	19.8	26.4
5 barg (73 psig)	3.7	7.4	11.1	10.1	20.2	30.3	40.4
6 barg (87 psig)	4.9	9.8	14.7	13.2	26.4	39.6	52.8
7 barg (102 psig)	5.7	11.4	17.1	15.5	31.0	46.5	62.0
8 barg (116 psig)	6.6	13.2	19.8	17.1	34.2	51.3	68.4
9 barg (131 psig)	7.6	15.2	22.8	20.2	40.4	60.6	80.8
10 barg (145 psig)	8.2	16.4	24.6	21.8	43.6	65.4	87.2
11 barg (160 psig)	9.3	18.6	27.9	24.9	49.8	74.7	99.6
12 barg (174 psig)	10.3	20.6	30.9	26.4	52.8	79.2	105.6

* Consult factory for higher N2 purities and feed air requirements.

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