#### **MAN Energy Solutions** Future in the making



# MAN RigiSeal

MAN RigiSeal is an efficient sealing solution for use when the supply gas is contaminated by liquids or particles. It is used primarily in centrifugal compressors in the oil and gas, refinery and petrochemical industries.

#### Benefits at a glance

- Lasts longer than normal seals in wet and dirty environments
- Modular design adapts to the needs of every project
- Eliminates contamination problems
- Low conversion and operation costs



## MAN RigiSeal

### **Technical Data**





#### **Operation range**

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p = up to 450 bar (6,525 PSI) and more
t = -200 °C +230 °C (-328 °F +446 °F)
vg = up to 227 m/s (744 ft/s)
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#### **Materials**

Seal face	Silicon carbide with DLC or DiamondFace coating
Seat	Silicon carbide with DLC or DiamondFace coating
Secondary seals	PTFE or FKM
Metal parts	

#### **Development aims**

The MAN RigiSeal was developed in cooperation with EagleBurgmann with the aim of addressing some of the most common issues of dry-gas seals: improving lifetime expectancy and increasing the time intervals between maintenance operations.

#### **Robust seal**

The result is a simpler and more robust dry-gas seal that avoids compressor venting, consumes less nitrogen, and lowers CAPEX and OPEX costs. The new seal system compensates seal contamination resulting from uncertainties in seal gas conditioning like blurring in dew point calculations (changing gas composition), unexpected operational problems (heater failure, seal gas booster failure) and/or unexpected process problems such as liquids in compressor gas stream.

#### Modular design

Thanks to its modular design, the seal can be adapted on a case-by-case basis for existing machines as well as for new projects. The necessary seal features are defined according to the prevailing operating conditions and/or the result of the failure analysis.

#### Low OPEX and CAPEX

Low operational costs result from the robust seal design, which reduces unplanned maintenance and increases meantime between outages. The new seal arrangement also reduces nitrogen consumption. The simplified support system reduces initial costs and reduces maintenance requirements.

#### **Applications**

- Oil and gas industry
- Refinery industry
- Petrochemical industry
- Applications with upstream gas treatment (glycol)

#### **Key components**

- Improved seal gas extraction The MAN RigiSeal uses a technology from MAN subsea compressors that positions the extraction point at the impeller tube area (used to extract gas to cool the electric motor). This has the advantage of obtaining pre-filtered gas thanks to the centrifugal forces acting there.

#### - Smart seal gas labyrinth

The smart seal gas labyrinth is an additional mechanical barrier for potentially dirty gas and prevents it from reaching the critical area of the seal. Together with the improved seal gas extraction feature, it reduces the need for additional filtration in the support system.

#### - Seal washing system

The patented washing system is a first for dry-gas seals. When the system reaches a critical condition washing fluid (naphtha) is injected directly at the seal's critical area and then flushed with nitrogen. The washing system can be controlled online and can be used as frequently as needed, even in hot conditions.

#### - DiamondFace coating

DiamondFace is a very robust coating and is a necessary addition when using the washing feature. It prevents damage of seal faces by liquids and particles, heat, and friction. EagleBurgmann has used this coating for many years in many applications.

#### - CobaSeal

This coaxial separation seal is a pre-requisite for the new labyrinth backup seal feature. The coaxial design is immune to short term  $N_2$  supply failure and its contact- and wear-free operation ensures long service life. The nitrogen consumption of the CobaSeal is extremely low

#### - Labyrinth backup seal

This new backup sealing element eliminates the secondary seal stage. It is based on a Polytetrafluoroethylene (PTFE) sealing labyrinth sleeve. The PTFE compound has a thermal expansion rate close to aluminum and excellent wear and sliding properties. It is immune to hang-up problems and tolerates contamination.

#### **MAN Energy Solutions**

86224 Augsburg, Germany P + 49 821 322-0 F + 49 821 322-3382 info@man-es.com www.man-es.com

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