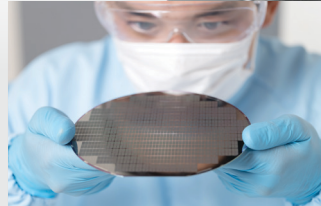




Isolast® K-Fab™ Seal

INCREASED OPERATIONAL EFFICIENCY IN CRITICAL SUBFAB PROCESSES



The Isolast® K-Fab™ flange seal from Trelleborg Sealing Solutions, gives long-term sealing and increased productivity in today's most extreme Subfab conditions. Its high sealing integrity and unique retention feature, which eases fitment of the seal into NW/KF/ISO flanges, contributes to significantly extending preventative maintenance cycles.

As microchips become ever smaller and complex, processes continue to evolve as new technology is developed. Temperatures are increasing, which leads to more aggressive chemical effluents being handled in the subfab. These can be extremely destructive to the elastomer seals in flanges.

The traditional sealing method for flanges has been with an O-Ring. However, as conditions within the flange become more challenging, O-Rings are subject to premature failure. The Isolast® K-Fab™ flange seal offers a solution to this.

A perfluoroelastomer (FFKM) specifically formulated for semiconductor applications forms the sealing element of the Isolast® K-Fab™ flange seal. This is resistant to both extreme temperatures and the complex chemistries found in critical subfab environments. The elastomer element uses far less material than traditional O-Rings, improving the seals thermal properties, eliminating thermal expansion and groove overfill.

The unique design of the elastomer element makes a puzzle-shaped connection to the flange insert, giving the Isolast® K-Fab™ flange seal the major advantage of making assembly of the flange considerably easier.

Features and benefits

- Suitable for high temperature subfab applications up to +325 °C / +617 °F (depending on material selection)
- Optimal seal design increases the sealing performance, especially with varying pressure or vacuum conditions for increased service life and overall lower cost of ownership
- Custom seal geometry with significantly less rubber eliminates overfill and extrusion from thermal expansion where typical O-Rings fail in vacuum fittings
- Seal geometry can withstand misalignment of the flange when compared with an O-Ring
- Suitable for vacuum and overpressure conditions
- Ideal solution wherever the chemical and thermal resistance of an O-Ring vacuum fitting solution is no longer sufficient
- Easier handling and assembly due to retention mechanism
- Easy retrofit into KF, ISO, NW flange fittings as an O-Ring replacement
- Cleanroom washed and packed on request

Typical applications

- KF, ISO, NW vacuum fittings
- Exhaust lines and vacuum piping systems
- Pumps
- Scrubbers and gas abatement systems
- Valves

Materials

Suitable for combination with both aluminum or stainless steel, Isolast® FFKM represents the ultimate material for the K-Fab™ flange seal due to its compatibility to the most aggressive of semiconductor media. The K-Fab™ seal type is also available in fluorocarbon (FKM) for less demanding applications chemically or where manufacturers wish to take advantage of the benefits of the unique retaining mechanism to lower assembly costs.

Elastomer Material	Application
Isolast® FFKM	Aggressive media in temperatures up to +325 °C/ +617 °F
Isolast® PureFab™ FFKM	Ultra-high purity for aggressive media in temperature up to +327 °C/ +620 °F
FKM	Temperatures up to +200 °C/ +392 °F
PureFab™ FKM	High purity in temperatures up to +225 °C/ +437 °F

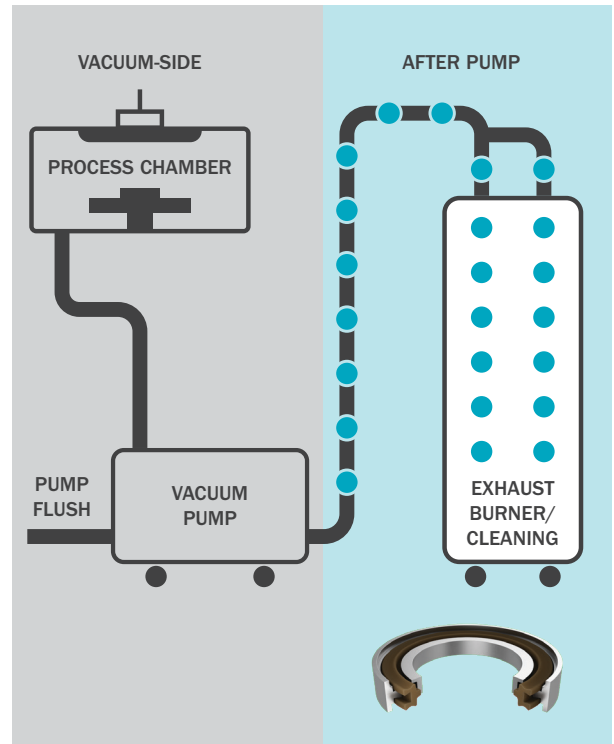
Test results

State-of-the-art Finite-Element Analysis (FEA) optimized the Isolast® K-Fab™ flange seal virtually while extensive laboratory and field testing proved the seal in application. Helium leakage tests were performed under vacuum and positive pressure conditions*

Vacuum performance	Helium leakage rate (mbar.l/s)
After 10 mins	1.9×10^{-7}
After 15 mins	4.5×10^{-7}

Overpressure performance	Helium leakage rate (mbar.l/s)
Pressure atmosphere	5.2×10^{-6}
0.5 bar	5.0×10^{-6}
1.0 bar	4.8×10^{-6}
1.5 bar	4.6×10^{-6}
2.0 bar	4.4×10^{-6}

*Proprietary test method



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