



AVIATION CASE STUDY

GENERATOR SEAL IN HYBRID ENGINE AIRCRAFT





OMNISEAL® ROTARY LIP SEALS

Generator Seal In Hybrid Engine Aircraft

Mark Scoular October 2023

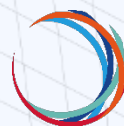
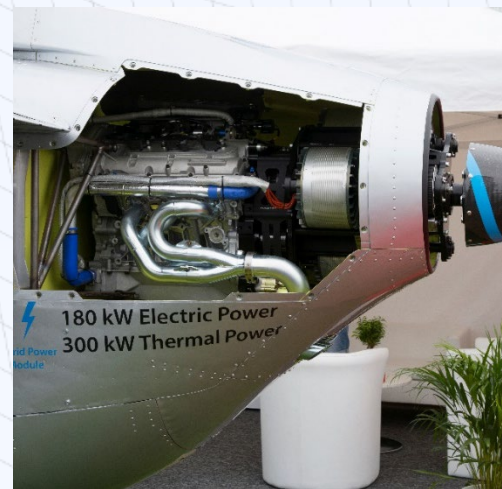
AVIATION HIGH SPEED LOW COEFFICIENT OF FRICTION HIGH DURABILITY

Environment

Recent advances in electrical motors, energy storage systems, and power electronics converters (PEC) are leading to aircraft becoming increasingly electrical. However, hybrid technologies are also a viable option for greener air travel. These hybrid engines convert several power sources to the relevant system of the aircraft, adjusting power supply to actual needs during flight. This makes power converters in hybrid engines a critical part, and their efficiency of utmost importance.

Challenge

Compact design and high efficiency entail a high speed rotating shaft (surface speed superior to 40 m/s – 7900 ft/min), which connect the turbine and the power converter. The generator shafts rotate at variable speed where the rotating shaft seal must allow very low leakage on the complete range of speed. To minimize the downtime of the engine, the seal needs to last the lifetime of the engine.



Omniseal Solutions
SAINT-GOBAIN

Solution

Omniseal Solutions designs Omniseal® rotary lip seals that enable compact design, high speed sealing and excellent durability. Due to its extremely durable, long wearing jacket material that provides excellent wear resistance, these polymer lip seals have been trusted by our customer for many years.

The robustness and compactness of our sealing solution help the designer, while the ability to run dry is a major advantage for the system reliability.



A lasting sealing solution for lighter weight & cleaner air travel

Benefits

- Long life time of the customized lip seal minimizes downtime
- PTFE lip seals are able to run dry in case of loss of lubrication, improving overall system reliability
- Compact design simplifies overall system design and enables weight reduction

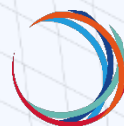
Specification

Solution
Area
Material
Precision part

- Omniseal® Rotary Lip Seal, Series 31
- Generator in hybrid engine
- High-Performance Polymer Material A27
- Custom Lip Seal
- Media: Jet Oil
- Temperature: -40°C to 150°C (-40°F to 302°F)

Technical details

- Speed: up to 44 m/s
- Pressure difference: Up to 10 PSI (0,7 BAR)
- Counter face: Chromium hardened shaft



Design Expertise & Tailor-made Solutions for Your Critical Applications

Omniseal Solutions is a global engineering leader with over 65 years of historical legacy, relentlessly dedicated to the design and manufacture of precision sealing and material solutions that protect critical applications in the most demanding environments and passionately driven to push *Beyond the Boundaries of Possible*.



About the Author

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