



Omniseal Solutions
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the boundaries of possible



AVIATION CASE STUDY

HIGH PRESSURE TURBINE SHROUDS





OMNISEAL® METAL FACE SEALS

High Pressure Turbine Shrouds

Mark Scoular October 2021

AVIATION EXTREME TEMPERATURE VIBRATION RESISTANCE HIGH ACCOMMODATION

Environment

A high pressure turbine in a jet engine is one of the hottest parts in an airplane since this section is right after the combustion section and can reach extreme temperatures and pressures from the expanding airflow. Maintaining air flow control in this area is key to ensuring the efficiency of the engine because any type of leak is a waste of energy. To maintain a tight control on air flow in the turbine as well as limit vibration, metal shrouds are used, facing the tip of the turbine blades.

Challenge

To benefit fully from their function, shrouds need to be tightly sealed to the casing. With the harsh environment of extremely hot air and high vibration as well as high dilatation of the hardware, it can be challenging for [aviation manufacturers](#). A sealing part needs to be installed to not only accommodate very large dilatation and avoid damage to the hardware through contact friction during dilatation and vibration but also ensure tightness.



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Solution

Our customized, [Omniseal® metal E-Seals](#) are designed for the shroud set for air flow restriction with an excellent spring back to cope with the vibrations and large joint movement.

The metal seals are coated with a proprietary ceramic plating, reducing the friction and providing excellent wear resistance. To simplify the installation, the sealing solution is segmented to fit the existing grooves and may be pre-compressed to further ease the mounting.



Minimize your losses & maximize your efficiency by using Metal E-Seals!

Benefits

- Customized fit for ease of installation and tight air flow control
- Proprietary, protective coating for increased lifetime and hardware protection

Specification

Solution Area Material Precision part	• Omniseal® Metal E-Seals
	• High Pressure Turbine
	• Metal
	• Shroud seal
Technical details	• Media: Hot air • Temperature: Above 500°C (932°F) • High wear resistance • Long lifetime expectancy



Omniseal Solutions
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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

Mark Scoular

Business Development Manager -
Aviation

Cleveland, Ohio, USA

+1-330-242-4698

mark.scoular@saint-gobain.com

Omniseal Solutions™
help@omniseal-solutions.com
www.omniseal-solutions.com