

SAINT-GOBAIN SEALS APPLICATION CASE STUDY

Space: Case of the Liquid Oxygen Rocket Engine Valve Seal



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CUSTOMER CRITICAL DIFFERENCE

What makes a rocket that is several million pounds lift off? A chemical reaction that involves liquid oxygen! Liquid oxygen, the most common oxidizer used in rocket engines, mixes with propellants like liquid hydrogen, kerosene or methane, to enable combustion and thrust to make the rocket fly. In order to lift off safely, the right amount of liquid oxygen and propellants that enter the engine must be controlled, which is where valves and the sealing of these valves are critical.

Our **OmniSeal® 103A** spring-energized seal is used as a radial seal in the valve seat to ensure that no liquid can pass through and no leakage occurs when the valves are closed. The seal is ideal for these [cryogenic](#) extremes.

CONNECTED APPLICATION

OmniSeal® 103A Seal: Used in several other valves in a rocket engine like cryogenic, solenoid and butterfly valves that use liquid oxygen and other fluids like liquid hydrogen or hypergolic fuels.

Critical parts
making THE difference



SEALS

SAINT-GOBAIN



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PRODUCT SOLUTION

OmniSeal® 103A

AREA

Main Fuel Valve of Rocket Engine

MATERIAL

Fluoroloy® A20

CRITICAL PART

Custom Spring-Energized Radial Seat Seal

TECHNICAL DETAILS

- Media: Liquid Oxygen
- Temperature: -320°F to 150°F (-196°C to 66°C)
- Motion: reciprocating
- Pressure: few hundred psi (15-20 BAR)
- Counter face: Inconel

BENEFITS AND ADDED VALUE

- Moderate to high spring load for sealing at static, slow and moderate speed conditions
- No material cracking at cryogenic temperature
- Excellent seal surface finish for cryogenic sealing
- Product cleanliness in oxygen service per IEST-STDCC1246



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