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# LIFE SCIENCE CASE STUDY

## MICROSURGICAL DEVICE MINIATURE MOTOR





OMNISEAL® SPRING-ENERGIZED SEALS

## Microsurgical Device Miniature Motor

Jeff Ribley & Joan Maldonado     June 2021

LIFE SCIENCE     MINIATURE SEALS     WEAR & FRICTION

### Environment

Powered, microsurgical devices is a trend that began in the early 2010s with developments in minimally invasive surgery providing the benefits of smaller incisions and more versatile solutions for surgeons, including better patient recovery times. Since then, the industry has seen a rise in miniature motors in surgical tools, pumps and ventilation equipment. As these tools must be precise, reliable and withstand over a thousand autoclave cycles, the micro-motors operating the tools are placed under challenging and strenuous demands. Customers and OEMs are looking for much smaller sealing options for leakage control and device protection.



### Challenge

The challenge is to provide miniature sealing options for leakage and long running operation for micro-motors and pumps. Many of the motors and pumps have a continuous operation requirement so wear and friction are also important for the service life and duration. Each of the pump and motor requirements are unique so each seal must be custom designed.



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Generally, larger seals are more complex and expensive to produce. Once spring-energized seals reach sizes below ¼ inch, they also become increasingly more difficult and expensive to commandeer. While manufacturers might be able to minimize the number of miniature seals required by making design changes and some of the components disposable, these types of devices - typically used for 50 to 100 surgeries before disposal - would still need to be autoclaved, and its electronics protected.

## Solution

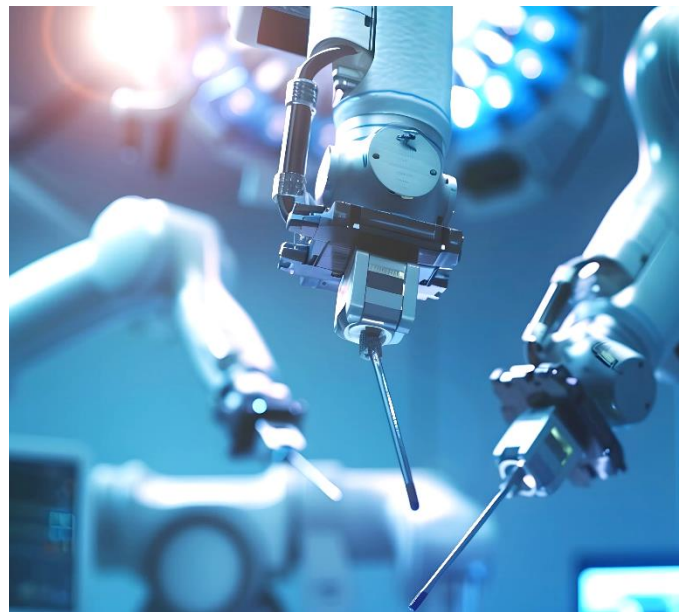
Omniseal Solutions has risen to the challenge by providing Omniseal® sealing solutions for micro-motors and shaft sizes that are 1 mm and smaller, which are some of the smallest in the world.

Along with the required miniature size, the business has designed several manufacturing processes and materials to accommodate other requirements. Designs for the motors have included material to minimize shaft friction, maintain seal width and protect shaft bearings. Biocompatible, FDA or Class VI materials are available depending upon fluid interaction including blood or bodily fluids. Designs have accommodated varying shaft speeds and unique surface finish for motors and pumps.

Good things come  
in small packages.

## Benefits

- Custom design accommodates limited space constraints
- Materials are biocompatible with the motor and pump application conditions
- Maintains full RPMs for long service life with confidence



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Need Help To Solve The Insoluble?  
Contact Our Experts!

## 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 wear control solutions that protect critical applications in the most demanding environments and passionately driven to push “Beyond the Boundaries of Possible.”

### Contact Our Life Science Team



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boundaries of **possible**

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