



## Extend the Life of Medical Equipment with GP Bearings

**S**urgical instrument manufacturers rely on NMB for best-in-class performance and operating life of our miniature precision ball bearings. Our patented bearing materials coupled with bio-compatible lubricants are an ideal solution for medical devices that require human contact and sterilization.

Robotic-assisted surgical procedures have increased year over year, going from just 1.8% of all general surgeries in 2012 to over 15% in 2018 according to research by JAMA Network Open. These procedures are typically less invasive, which results in better patient outcomes and improved recovery times. The market has also become more fragmented, with startup companies developing dedicated equipment for individual procedures or segments. One thing has remained constant – the need for quality components that can withstand harsh operating and sterilization conditions.

### **Autoclave**

The autoclave process uses pressurized steam to sterilize medical or laboratory equipment that has been contaminated. This treatment inactivates most biological contaminants such as viruses, bacteria, fungi and spores, and ensures that reusable medical equipment is sufficiently clean. While the debate between disposable and reusable medical equipment will continue, a case can be made for reducing hospital waste by investing in reusable devices and sterilization systems. However, due to the high temperature (over 250°F) and pressure, this can cause device failures due to corrosion. Manufacturers should consider the recommended cleaning process when choosing components, and validate each part is able withstand repeat exposure for the lifetime of the equipment.



### Advanced Technology

NMB began manufacturing ball bearings over 70 years ago, and we are committed to developing advanced technologies to help solve our customer's challenges. Our research team closely studies the material characteristics of bearing steel such as composition, crystal structure, impurity and hardness, all of which can affect bearing performance. The Giga Protection® Bearings are made from a patented blend of steel that resists corrosion up to 200 times more than standard stainless steel when compared after performing a salt spray test. In addition, it does not require a special assembly or manufacturing process, which provides cost savings. NMB GP bearings have been proven to stand up to the intense autoclave process.

When a medical device needs to be used within the body, it is important to utilize biocompatible materials so as to avoid and adverse reactions in the patient, such as irritation or cytotoxicity. Rigorous testing should be performed to evaluate the effects on living organisms for invasive, and sometimes even non-invasive devices. To ensure the highest quality and reliability, these lubricants should carry ISO 10993 approval. Our engineering team can help identify, source and test lubricant formulations in order to optimize the bearing for each medical application.

Medical devices pose many challenges for designers, including biocompatible material considerations and sterilization concerns, all while keeping the final product small, lightweight and easy to use. NMB Bearings with Giga Protection can withstand the autoclave process used to sterilize medical equipment and prevent rust and corrosion throughout the lifetime of the equipment.



## Giga Protection®

GP Bearings (High Anti-corrosion Bearings)



**24 Hours**  
 Standard Stainless Steel Bearing  
 \*Salt Spray Test



**5000 Hours**  
 GP3 Corrosion Resistant Bearing



### Biocompatible Lubricant Characteristics

Product Code: LO116

Characteristics	Unit	Result	Spec	Method
Appearance	-	Clear	Clear	Visual
Color	-	Colorless	Colorless	Visual
Density (20°)	g/cm <sup>3</sup>	1,92	1,90-1,94	EN ISO 12185
Viscosity (40°)	mm <sup>2</sup> /s	493	480 - 520	DIN EN 16896