



## High Performance Silicones for Medical Device Manufacturers

Medical device manufacturers are constantly searching for high performance materials to help them enhance and advance their technological innovations. They soon discover that silicones are the go-to material for harsh and demanding environments. Silicone's unique molecular structure provides the rare combination of increased flexibility and high temperature resistance, allowing more versatility in the design, assembly process, and performance characteristics of modern medical electronics.



There are four key areas to consider when selecting the correct material for your medical device application.

### Certifications

The ISO 10993 series of standards evaluate the biocompatibility of medical devices based on material, contact type, and duration of contact. These standards cover a number of biological safety scenarios and enable medical device manufacturers to manage biological risk.

Novagard is proud to have independently tested products that meet the ISO 10993 standards. We've tested our silicones to: ISO 10993-5: cytotoxicity, ISO 10993-10: skin sensitization, and ISO-10993-23: irritation. The final selection of a material depends on application-specific performance criteria. While Novagard is happy to share ISO 10993 test data, customers are ultimately responsible for submitting their final product to the appropriate governing body to receive certifications.

### Adhesion & Bonding

Ensuring that your material adheres to your chosen substrate is critical when developing next-gen medical devices. When looking to bond a silicone to a silicone, both silicone adhesives and substrates have

low surface energy and similar chemical composition, making them compatible for bonding. An advantage of silicone adhesives is they maintain much needed flexibility after curing, making them suitable for applications such as wearable devices where movement or vibration is expected.

Novagard's 2-part silicones provide superior adhesion and cure speed. They are typically very quick curing materials with short open times that rapidly build green strength to allow parts to move swiftly from station to station in the assembly process without shifting.

### Flexibility

Many medical wearables and other wellness-related devices contain miniature, stretchable, electronic components requiring sealants and adhesives that can provide the same degree of movement and flexibility – a role where silicones excel. With superior dielectric performance, silicones can conform to complex geometries often found in design of flexible circuitry. They cure to a flexible coating that offers forgiveness when flexible hybrid electronics meet real life situations.

Novagard electronics grade silicones contain only non-reactive plasticizers

and release a non-corrosive methanol byproduct when curing, making them safe for electronics. We also offer UV and UV/dual cure silicones with UV tracers that cure on demand within 3 to 5 seconds that help speed production while maintaining superior quality during the assembly process.

### Environmental Conditions

Silicones offer extraordinary protection in harsh and extreme environments. Medical devices must be able to withstand wide temperature swings in sterilization or operation, and silicones offer thermal stability for reliable performance at sustained temperatures ranging from -40°F to 392°F (-40°C to 200°C).

Silicones protect electronics from moisture, humidity, dust, and chemical contaminants. They provide protection against shock and vibration, helping to extend the lifespan of medical devices and wearables.

With the miniaturization and electrification of everything, silicones play an increasingly important role in medical device development and production. Contact a Novagard sales manager today to discuss how we can partner with you on your next project.

