ProMed Develops Fluorinated Silicone Molding Solutions for Demanding Chemical Environments

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ProMed provides fluorinated silicone molding solutions designed for defense and security applications where chemical resistance and dimensional precision are critical. Fluorinated silicone, a modified elastomer with enhanced resistance to fuels, oils, and aggressive solvents, offers performance beyond standard silicone while retaining flexibility and thermal stability. That combination makes it a practical material choice for components that need to hold their shape and sealing performance in chemically demanding operating conditions.

The material is used in components exposed to jet fuel, hydraulic fluids, lubricating oils, and hydrocarbon-based cleaning agents that challenge standard silicone elastomers. Components molded from fluorosilicone maintain structural integrity under repeated thermal cycling and chemical exposure, helping seals, gaskets, and enclosure interfaces perform consistently over their service life. Fluorinated silicone is particularly relevant in defense and security assemblies where hydrocarbon contact and low-temperature flexibility must both be addressed within a single sealing or containment component, without sacrificing fit or function.

ProMed works with both liquid silicone rubber (LSR) and high-consistency rubber (HCR) forms of fluorinated silicone. LSR is processed through automated injection molding, delivering tight tolerances, rapid cure times, and the ability to produce complex geometries with minimal post-processing. HCR is processed through compression or transfer molding, offering high tear strength and an established history in long-term defense program components. This flexibility allows engineers to select the appropriate material and process based on part geometry, production volume, tolerance requirements, and the performance demands of the end-use environment.

The company integrates material selection, precision tooling, and controlled manufacturing environments to maintain quality. Quality systems include ISO 13485 certification, ITAR registration, and FAR/DFARS compliance as an American-owned corporation. Traceability is maintained through detailed records, Certificates of Conformance, and Certificates of Analysis, providing documentation for program qualification

and regulatory submissions. That level of documentation also supports customers that need clear material and production records as part of internal quality reviews or external compliance requirements.

Dimensional control is supported by advanced metrology, including computed tomography (CT) scanning, coordinate measuring machines, and optical inspection systems, ensuring parts meet tight specifications. Environmental monitoring tracks particulate levels, temperature, and humidity to maintain consistency across production runs. These measures support reproducible performance in critical defense and security components where tolerances as small as ±0.05 mm can influence function and reliability. In applications where sealing surfaces, interface points, and molded geometries all have to align precisely, small dimensional variation can have an outsized effect on final performance.

Fluorinated silicone molding at ProMed also includes multi-material and overmolded assemblies. Fluorosilicone components can be combined with thermoplastics, metals, or other elastomers to create integrated components, reducing assembly steps while maintaining functional and dimensional integrity. Applications range from fuel system seals and hydraulic interface components to enclosure gaskets and environmental sealing features in defense and security assemblies. This supports programs that need chemical resistance, mechanical stability, and part-to-part consistency in a compact component design.

ProMed's approach ensures that manufacturers can deliver chemical-resistant, dimensionally precise components suitable for regulated defense and security applications. The combination of material expertise, precision molding capabilities, and quality management ensures consistent performance, regulatory compliance, and traceable documentation throughout the production lifecycle.

About ProMed:

Since 1989, ProMed has been recognized as a leading Contract Manufacturer of complex, intricately designed molded silicone and plastic components and assemblies for highly regulated industries. ProMed's expertise extends across applications for short-term and long-term implantable devices, single use devices, drug-releasing combination devices, and specialized materials and processes for defense applications. They collaboratively work with our customers from prototype through production, providing over 30 years of experience related to design for manufacturability, material selection, tool and fixture design, process development, manufacturing, and other value-added services that result in cost-effective solutions with superior quality.

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