Advanced Materials and Market Opportunities

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Fabricators who cut or mold gaskets from advanced materials can achieve higher profit margins. They can also access market opportunities that aren't available to competitors who only fabricate products from commodity rubber. Today, advanced materials like specialty silicones are supporting projects not just on land and at sea, but also in the air and in space. Yet some material suppliers can't provide fabricators with full traceability or meet tough specifications.

EMI Elastomers

Silicones that are filled with metal or metal-coated particles provide environmental sealing, electrical conductivity, and shielding against electromagnetic interference (EMI). For military projects, silver-filled silicones that meet the lettered requirements of the MIL-DTL-83528 specification are available. For example, the MIL-DTL-83528 Type A, B, C, D, and K materials that Specialty Silicone Products (SSP) supplies are used in both military gaskets and M83528 O-rings.

Silver is subject to price fluctuations, however, so projects that don't require silver-filled elastomers can use EMI silicones filled with nickel-coated graphite instead. For marine applications where galvanic corrosion is an issue, nickel-aluminum products can provide proven performance. For example, two SSP materials – SSP2529 and SSP2551 – have been tested by an independent laboratory and use silicone and fluorosilicones for the base elastomer, respectively.

Military and Aerospace Materials

Some military and aerospace projects don't need gaskets that are electrically conductive. However, they require A-A-59588 materials instead. This General Services Administration (GSA) specification replaced ZZ-R-765E and covers six classes of silicone rubber in various grades. SSP supplies fabricators with A-A-59588 elastomers, including Class 3A and 3B silicones that have been independently tested for resistance to flexural fatigue, a problem that can cause gaskets to crack.

AMS-R-25988B, another specification, comes from SAE International and replaced MIL-DTL-25988 from the Air Force Research Laboratory (AFRL). Both specs cover molded fluorosilicones with oil and fuel resistance. A change in specs isn't all fabricators must consider, however. Because of sourcing challenges, some suppliers have substituted ingredients and invalidated their claims to compliance. That's not the case at SSP, where we offer a certificate of analysis (COA) with every batch.

Advanced Materials for Space-Based Applications

The 1960s version of the TV show *Star Trek* described space as the final frontier. Today, it's more like a high-growth market opportunity. From spacecraft to ground stations, military and civilian projects need advanced materials. The low temperatures of space are challenging, but so are its vacuum conditions. In the absence of air, volatiles from ordinary silicone gaskets can cloud cameras, optics, and sensors. EMI gaskets also need to handle the cold and have low levels of outgassing.

For gasket fabricators in search of market opportunities, it's important to find space-age materials that can meet these challenges. Today, two new phenyl-based products are available. SSP2575 is a non-conductive elastomer that maintains its flexibility at temperatures as low as -116°C (-177°F) and passes ASTM E595 outgas testing. SSP502-55LT is a nickel-graphite shielding silicone that withstands extreme cold, has low outgassing, and is part of NASA's approved materials list.

Strategic Sourcing for New Opportunities

The silicone supply isn't as constrained these days, but fabricators who practice strategic sourcing get greater value from their purchasing decisions. For example, engineers who specify conductive and non-conductive elastomers from SSP gain access to technical consulting, in-house testing, and a research and development team. Advanced materials are enabling market opportunities, but fabricators need material suppliers with traceable products that meet tough specifications.