

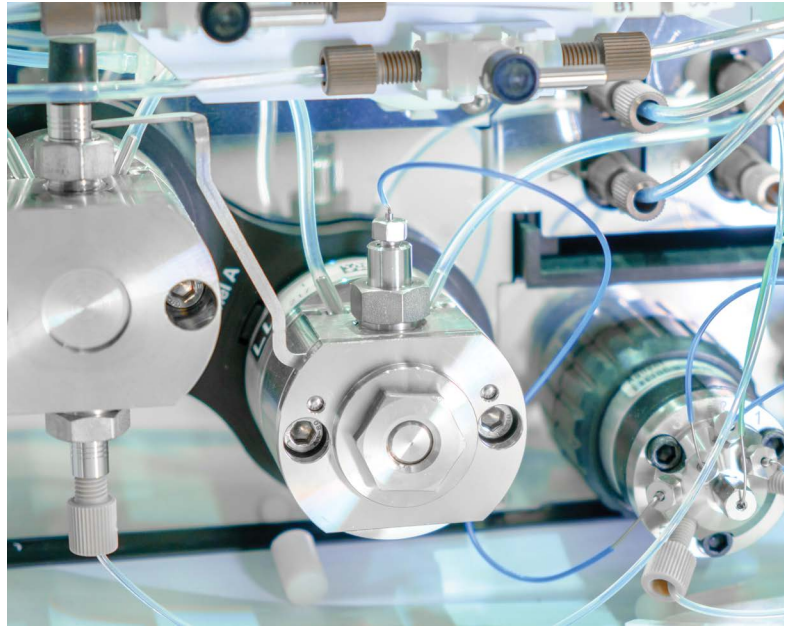
# **Solutions for Analytical Instrumentation**

The Greene Tweed Advantage



## The Greene Tweed Advantage

Greene Tweed has been pushing the boundaries of material science for 160 years. We design and manufacture thermoplastics, elastomers, composites, sealing solutions, and engineered components for harsh environments and demanding applications. With proven expertise in Analytical and Life Sciences applications, our experts work with you to develop an engineered solution that is resilient, efficient, and sustainable.



## Analytical & Life Sciences Materials Development

Components used in Analytical and Life Sciences applications must retain their physical properties and perform under highly aggressive chemical, pressure, and temperature conditions. Choosing the best material for the job helps maximize operational efficiency and reduce the risk of contamination and unintended downtime. Drawing from more than a century of proven

material expertise, Greene Tweed offers several high-performance elastomers and thermoplastics that can be manufactured into standard and custom geometries for applications across a wide range of industries including Chemical Processing, Pharmaceutical and Analytical, Agriculture, Food & Beverage, Water & Environmental Testing, and more.

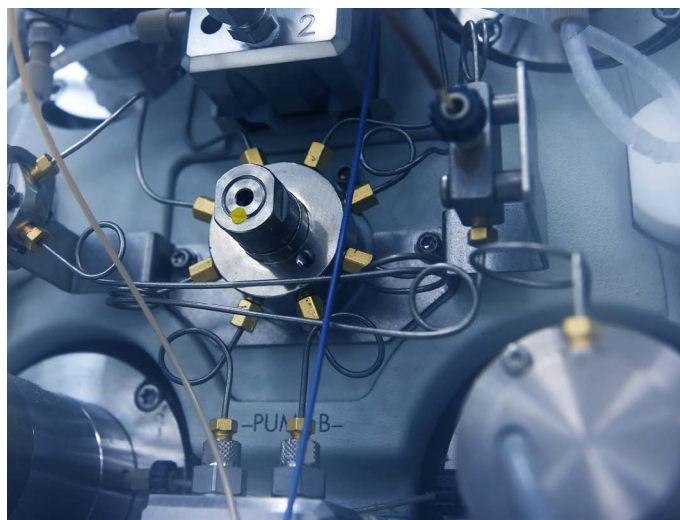
Greene Tweed solutions are already used in several Analytical and Life Sciences applications including chromatography systems, hematology analyzers, DNA synthesizers, in vitro diagnostic systems, pumps, solenoid valves, and connectors, and fittings.



## PEEK vs PTFE – What's the Difference?

PEEK material (polyetheretherketone) is a semi-crystalline engineering thermoplastic with outstanding harsh chemical resistance, low moisture uptake, and excellent mechanical strength and stability. PTFE (polytetrafluoroethylene) belongs to the fluoropolymer family and provides additional chemical resistance (especially to strong acids), a low coefficient of friction, low moisture absorption, and high electrical resistance. PTFE is not as strong as other polymers but is more flexible at low temperatures.

If you need a tough, rigid material for components where thermal and chemical properties are critical, check out Arlon® PEEK. If your application requires nonabrasive contact surfaces, high-temperature contact, low deformation under load, and strong chemical resistance at high surface speeds, Avalon® fluoropolymers deliver unparalleled lubricity.



## Chemraz® – a High-Performance Elastomer for your Toughest Jobs

Chemraz® is our highest-performing elastomer and the ultimate elastomeric material. With temperature ratings up to 323°C (615°F) and the broadest chemical resistance of any elastomeric material, Chemraz® is the prime choice for the most challenging Analytical and Life Science applications.

Chemraz® materials can be manufactured into O-rings, gaskets, and other specialty shapes and seal geometries, and have demonstrated reliability in high-performance liquid chromatography (HPLC), tissue processing, automated synthesizers, blood analyzers, and other analytical instrumentation applications.

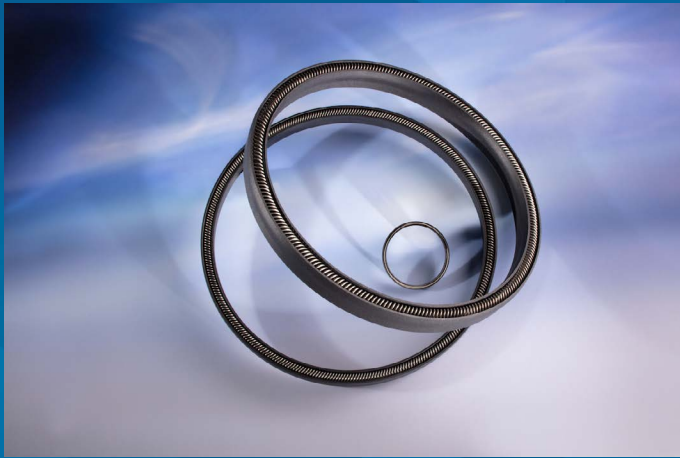






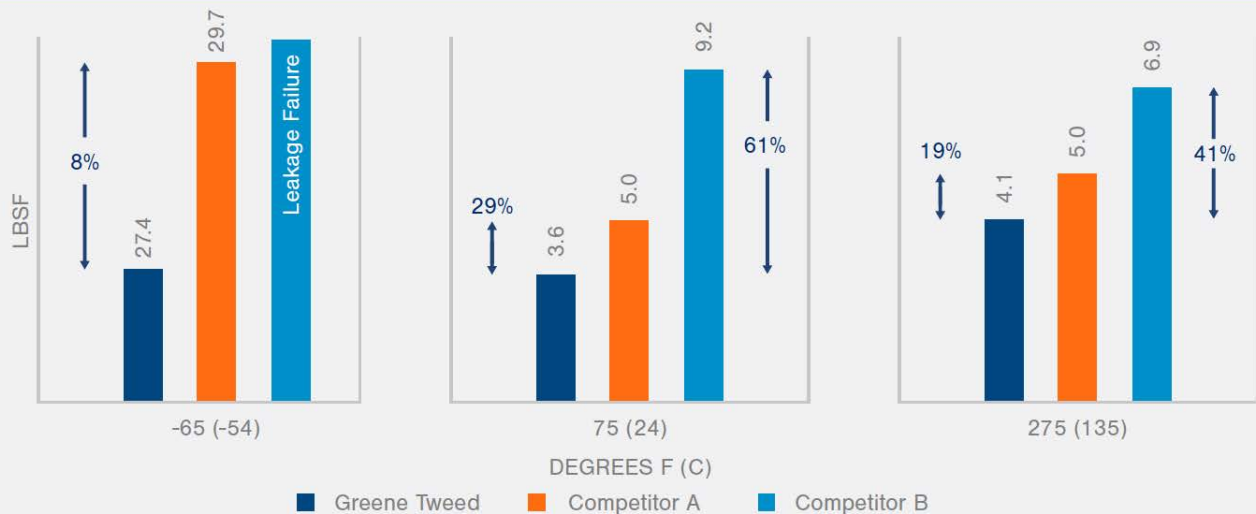
## Metal Spring Energized (MSE®) Seals

MSE® seals are custom designed with a dual-lip body for superior performance in the most demanding conditions. They are built to withstand extreme temperatures, high pressure, and corrosive chemicals common in Analytical and Life Sciences applications. MSE® seals come in a variety of materials and designs for customization in any application – and if you don't see the sealing solution you need in our catalog, we'll custom-engineer one.



In applications where friction reduction is a must, Greene Tweed's Canted Coil MSE® seal is designed to reduce power loss and improve precision movement without sacrificing leakage control or durability. With its broad chemical compatibility and resistance to extreme temperatures and pressure, this high-performance seal meets and exceeds the safety and wear requirements of a wide range of Analytical and Life Sciences environments.

### Percent of Friction Improvement Over Major Competitors



## FKM and FEPM Components

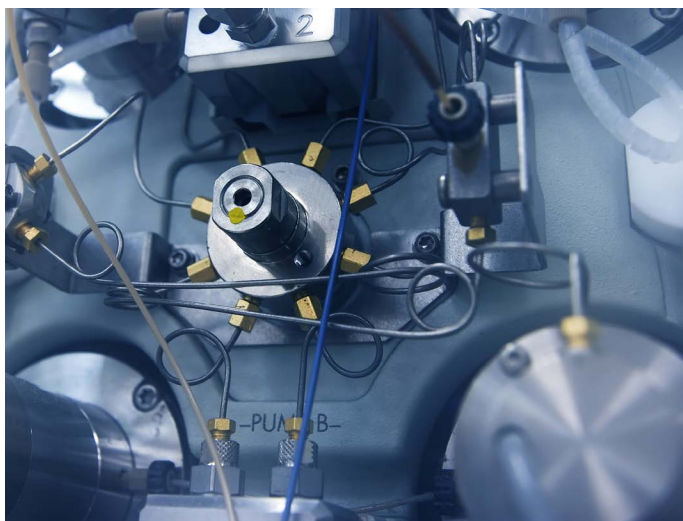
### Fusion® FKM

Fusion® FKM is a fluorinated, carbon-based synthetic rubber built to withstand extreme temperatures, high pressures, corrosive chemicals, and volatile fluids (including several fuels). Fusion® materials are typically used to manufacture O-rings, seals, and gaskets.



### Fluoraz® FEPM

If you need an elastomer with extreme resistance to volatile and corrosive chemicals, Fluoraz® FEPM is an ideal choice. These elastomers retain their form and function when exposed to harsh acids and bases like methanol, amines, ammonia, urea, and hydrochloric acid. They can handle heat and steam at temperatures up to 232°C (450°F) and offer several advantages over a standard FKM solution.



## Elastomers

Greene Tweed has developed a versatile catalogue of elastomer compounds for Analytical and Life Sciences applications. If you're looking for an elastomer sealing solution built to withstand extreme temperatures, harsh chemicals, and high-pressure environments, our engineers will design one for you. Explore our high-performance elastomer offerings below.

Type	Compound	Features & Benefits	Temperature Range	Durometer Hardness Shore A
FKM	Fusion 706	<ul style="list-style-type: none"> <li>An amber colored, high-purity compound</li> <li>For use where low sealing force is required and contamination is a concern</li> </ul>	-20°F to 428°F (-29°C to 220°C)	65
FKM	Fusion 707	<ul style="list-style-type: none"> <li>A blue colored clean compound known for its broad compatibility against aggressive chemicals</li> <li>Available in an infinite range of geometries and cross sections</li> <li>Ideal for flat panel displays</li> </ul>	-4°F to 428°F (-20°C to 220°C)	75
FKM	Fusion 665	<ul style="list-style-type: none"> <li>A carbon-black filled compound with high strength, low compression set, and excellent chemical compatibility, excellent sealability at ultra-low temperatures</li> <li>Mid-range durometer allows it to fit a wide range of hardware</li> <li>Can work in both static and dynamic sealing applications</li> </ul>	-70°F to 450°F (-57°C to 232°C)	75
FKM	Fusion 935	<ul style="list-style-type: none"> <li>A carbon-black filled compound that provides superior Rapid Gas Decompression (RGD) resistant properties enabling seal integrity</li> <li>Broad chemical resistance to substances such as methanol, sour gas, hot water, steam, and corrosion inhibitors</li> </ul>	-35°F to 450°F (-37°C to 232°C)	90
FKM	Fusion 938	<ul style="list-style-type: none"> <li>A carbon-black filled compound with improved RGD resistant properties to those of Fusion 935</li> <li>Certified to ISO 23936/NORSOK M710</li> <li>Good permeability with gaseous H<sub>2</sub></li> </ul>	-35°F to 450°F (-37°C to 232°C)	90
EPDM	845	<ul style="list-style-type: none"> <li>A carbon-black filled compound that provides good RGD-resistant properties to steam, CO<sub>2</sub> and Methane at similar temperature range to that of Fusion 665</li> </ul>	-65°F to 275°F (-54°C to 135°C)	90
EPM	953	<ul style="list-style-type: none"> <li>A carbon-black filled compound with excellent elasticity and low swell at the lowest temperature range of any compound</li> <li>Compatible with heat transfer fluids and solvents, excellent heat and ozone resistance</li> </ul>	-85°F to 302°F (-65°C to 150°C)	81
FEPM	Fluoraz 797	<ul style="list-style-type: none"> <li>A carbon-black filled compound with enhanced chemical compatibility to hot water, steam, and bases than Fusion products, but at a more limited temperature range</li> </ul>	23°F to 450°F (-5°C to 232°C)	80
FEPM	Fluoraz 890	<ul style="list-style-type: none"> <li>FDA Food Contact Number (FCN) 246</li> <li>FDA 21 CFR 177.2400 (d), Extractive Limitations for Perfluorocarbon-Cured Elastomers</li> <li>USP and Class VI Biological Reactivity Tests 3-A 18-03, Product Contact Surfaces in Dairy Equipment, Sections C &amp; D for Class I Rubber Material</li> </ul>	23°F to 450°F (-5°C to 232°C)	80

## Elastomers

Type	Compound	Features & Benefits	Temperature Range	Durometer Hardness Shore A
FEPM	Fluoraz 799	<ul style="list-style-type: none"> <li>A carbon-black filled compound with enhanced chemical compatibility to hot water, steam, and bases than Fusion products, but at a more limited temperature range</li> </ul>	20°F to 450°F (-7°C to 232°C)	90
FFKM	Chemraz 504	<ul style="list-style-type: none"> <li>Often chosen for its broad chemical compatibility and good performance in steam applications</li> </ul>	-30°C to 230°C (-22°F to 446°F)	65
FFKM	Chemraz 510	<ul style="list-style-type: none"> <li>Similar to Chemraz 505 but a higher durometer compound with improved strength and resistance to extrusion in applications with high differential pressures</li> </ul>	-30°C to 230°C (-22°F to 446°F)	90
FFKM	Chemraz 514	<ul style="list-style-type: none"> <li>A white specialty compound formulated without carbon-black</li> <li>Excellent performance in hot aqueous solutions and oxidizing media that attack carbon-black</li> <li>Ideal for industrial applications with strict contamination requirements</li> </ul>	-30°C to 220°C (-22°F to 428°F)	70
FFKM	Chemraz 517	<ul style="list-style-type: none"> <li>FDA Food Contact Number (FCN) 245</li> <li>FDA 21 CFR 177.2400 (d), Extractive Limitations for Perfluorocarbon-Cured Elastomers</li> <li>USP and Class VI Biological Reactivity Tests 3-A 18-03, Product Contact Surfaces in Dairy Equipment, Sections C &amp; D for Class I Rubber Material</li> </ul>	-30°C to 220°C (-22°F to 428°F)	80
FFKM	Chemraz 541	<ul style="list-style-type: none"> <li>Universal compound suitable for broad applications</li> <li>Excellent chemical resistance to acids, amines, and steam</li> <li>High strength and good compression set properties</li> </ul>	-16° C to 230° C (3°F to 446°F)	76
FFKM	Chemraz 555	<ul style="list-style-type: none"> <li>Developed for superior high-temperature capability versus Chemraz 605</li> <li>Excellent steam resistance</li> <li>Excellent resistance to compression set</li> </ul>	-12°C to 316°C (10°F to 600°F)	80
FFKM	Chemraz 564	<ul style="list-style-type: none"> <li>Developed for improved low-temperature performance</li> <li>Excellent resistance to compression set</li> </ul>	-40°C to 230°C (-40°F to 446°F)	80
FFKM	Chemraz 584	<ul style="list-style-type: none"> <li>A cream-colored specialty compound formulated without carbon-black</li> <li>Excellent performance in hot aqueous solutions and oxidizing media that attack carbon-black</li> <li>Ideal for applications with strict contamination requirements</li> </ul>	-30°C to 220°C (-22°F to 428°F)	70
FFKM	Chemraz 585	<ul style="list-style-type: none"> <li>FDA Food Contact Number (FCN) 245</li> <li>FDA 21 CFR 177.2400 (d), Extractive Limitations for Perfluorocarbon-Cured Elastomers</li> <li>USP and Class VI Biological Reactivity Tests 3-A 18-03, Product Contact Surfaces in</li> <li>Dairy Equipment, Sections C &amp; D for Class I Rubber Material</li> </ul>	-30°C to 220°C (-22°F to 428°F)	80

## Elastomers

Type	Compound	Features & Benefits	Temperature Range	Durometer Hardness Shore A
FFKM	Chemraz 605	<ul style="list-style-type: none"> <li>Developed for improved steam and high-temperature performance compared to Chemraz 505</li> </ul>	-20°C to 260°C (-4°F to 500°F)	80
FFKM	Chemraz 625	<ul style="list-style-type: none"> <li>FDA Food Contact Number (FCN) 245</li> <li>FDA 21 CFR 177.2400 (d), Extractive Limitations for Perfluorocarbon-Cured Elastomers</li> <li>USP and Class VI Biological Reactivity Tests 3-A 18-03, Product Contact Surfaces in</li> <li>Dairy Equipment, Sections C &amp; D for Class I Rubber Material</li> </ul>	-20°C to 260°C (-4°F to 500°F)	80
FFKM	Chemraz 678	<ul style="list-style-type: none"> <li>Developed for improved low-temperature performance and RGD resistance</li> </ul>	-40°C to 230°C (-40°F to 446°F)	90
FFKM	Chemraz 694	<ul style="list-style-type: none"> <li>Developed for superior performance at high temperatures in steam applications</li> </ul>	-12°C to 316°C (10°F to 600°F)	87

## Thermoplastics

Greene Tweed's advanced engineering thermoplastic components (AETs) offer numerous advantages over heavier, unwieldy metals. AETs are designed for thermal stability, chemical resistance, reduced wear, and enhanced mechanical performance in even the most volatile conditions. If you're looking for a material solution that's lighter, more versatile, and has a longer service life than metal, check out our thermoplastic offers below.

Type	Material Code	Material Name	Features & Benefits	Processability
PEEK	046	Arlon 1000	<ul style="list-style-type: none"> <li>A tan colored, tough, high-temperature, semi-crystalline thermoplastic, offers a unique combination of mechanical, thermal, chemical, and electrical properties. Can meet FDA 21 CFR 177.2415</li> </ul>	Injection Molded
PEEK	067	Arlon 1260	<ul style="list-style-type: none"> <li>Carbon fiber-reinforced version of Arlon® 1000, high modulus and tensile strength with a low coefficient of thermal expansion. Improved wear properties and lower permeability</li> </ul>	Injection Molded
PEEK	039	Arlon 1330	<ul style="list-style-type: none"> <li>PTFE filled Arlon® 1000 with lower flexural modulus and reduced friction values for sealing applications</li> </ul>	Injection Molded
PEEK	AXT	Arlon 3000XT	<ul style="list-style-type: none"> <li>Improved creep and extrusion resistance at higher pressure and temperature conditions (over 350°F) compared to other Arlon grades</li> </ul>	Injection Molded or Extruded
PTFE	301	Avalon 01	<ul style="list-style-type: none"> <li>Virgin PTFE grade deemed safe for food and drug use</li> <li>Can meet FDA 21 CFR 177.1550</li> </ul>	Compression Molded



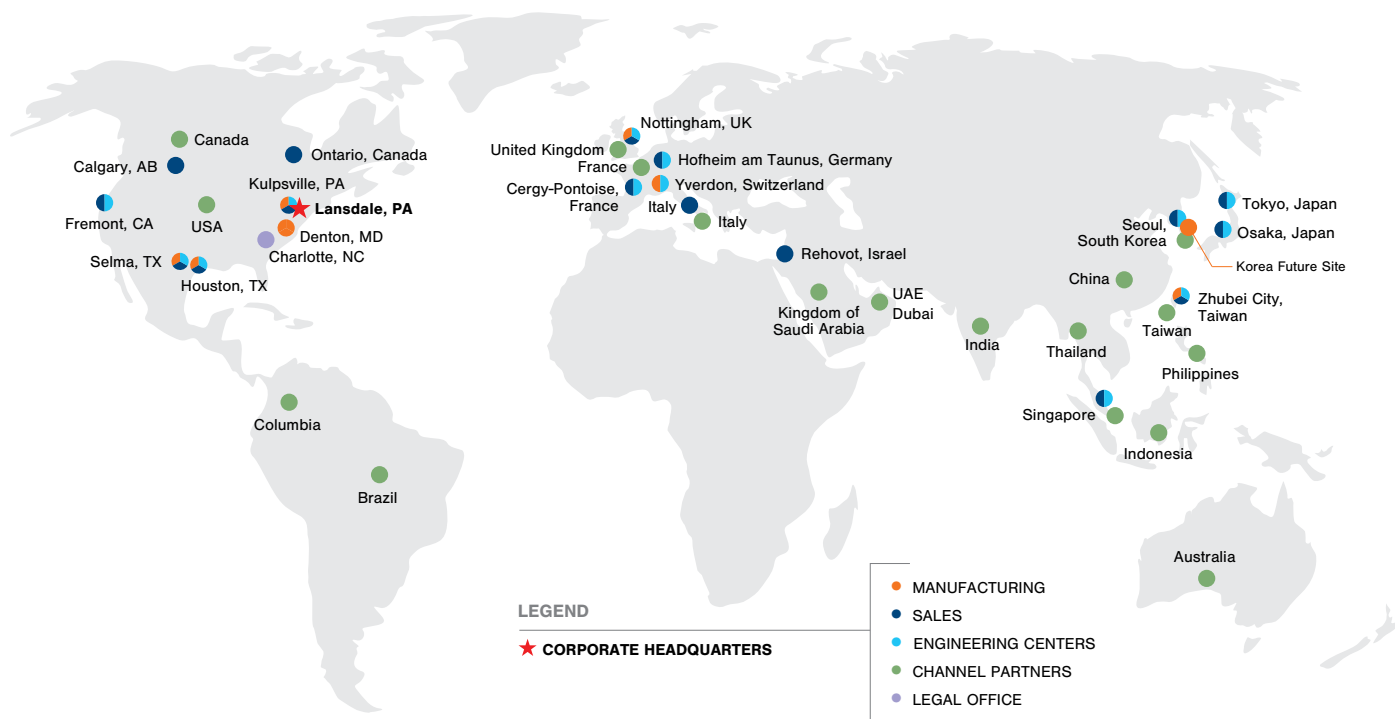
## Thermoplastics

Type	Material Code	Material Name	Features & Benefits	Processability
PTFE	043	Avalon 07	<ul style="list-style-type: none"> <li>A dark blue pigmented and MoS2 filled PTFE grade for enhanced chemical resistance, stiffness, and wear</li> </ul>	Compression Molded
PTFE	019	Avalon 09	<ul style="list-style-type: none"> <li>A dark gray graphite filled PTFE grade, with excellent extrusion resistance. Can work well in static and dynamic applications</li> </ul>	Compression Molded
PTFE	344	Avalon 44	<ul style="list-style-type: none"> <li>A dark gray mineral and MoS2 filled PTFE grade for self-lubrication while reducing abrasion on mating surface</li> </ul>	Compression Molded
PTFE	348	Avalon 48	<ul style="list-style-type: none"> <li>A white colored, mineral filled grade for improved wear resistance. Widely used in the food and pharma industries</li> </ul>	Compression Molded
PTFE	069	Avalon 50	<ul style="list-style-type: none"> <li>A tan colored, aromatic polyester filled grade for Improved temperature range and wear resistance in dry environments</li> </ul>	Compression Molded
PTFE	069	Avalon 56	<ul style="list-style-type: none"> <li>A white colored, modified virgin PTFE that provides lower deformation under load, better extrusion resistance, and improved sealability in gaseous environments than Avalon 01</li> <li>Can meet FDA 21 CFR 177.1550</li> </ul>	Compression Molded
PTFE	357	Avalon 57	<ul style="list-style-type: none"> <li>A tan colored polyimide filled PTFE with exceptionally low wear and friction in dynamic applications</li> </ul>	Compression Molded
PTFE	379	Avalon 69	<ul style="list-style-type: none"> <li>A dark brown colored carbon and PPS filled PTFE for improved wear and a low coefficient of thermal expansion</li> </ul>	Compression Molded
PTFE	330	Avalon 87WS	<ul style="list-style-type: none"> <li>A translucent white colored filled grade that provides improved compression and wear properties over Avalon 01</li> <li>Certified to FDA 21 CFR177 1550 and USP Class VI compliant</li> </ul>	Compression Molded
PTFE	389	Avalon 89	<ul style="list-style-type: none"> <li>A dark brown colored, moly and PPS filled PTFE that provides excellent wear and deformation resistance</li> </ul>	Compression Molded
UHMW-PE	015	Avalon 37	<ul style="list-style-type: none"> <li>A Natural color polyethylene material with good stress, abrasion wear and corrosion resistance, low coefficient of friction, and resistance to oil</li> <li>Can meet FDA 21 CFR 177.1520</li> </ul>	Extruded

# Contact Us!

With over 200 engineers working throughout North America, Europe, and Asia, Greene Tweed delivers exceptional responsiveness to our customers around the world.

From design through manufacture, we are committed to delivering innovative and customized material solutions that drive your technological advances. And with our vast network of technical and manufacturing resources, we have the support you require for your most critical applications. Please contact your local Greene Tweed representative for more information about our comprehensive elastomer and thermoplastic offerings.



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