

## Greene Tweed – A History of Semiconductor Innovation

Greene Tweed has been developing high-performance sealing solutions to withstand the extreme conditions of semiconductor processing since the 1980s, and has continually evolved to meet the increasingly demanding needs of the industry.

Greene Tweed leverages decades of engineering, materials, and applications expertise to design customized sealing solutions for specific operating environments, such as the oxygen- and fluorine-intense etch and deposition processes.

Greene Tweed was the first U.S. company to build a seal manufacturing cleanroom to meet the microcontamination needs of semiconductor manufacturers. Greene Tweed's Elastomer Center of Excellence (CoE) cleanroom provides the complete integration of elastomer development – from initial raw material mixing & development to final product packaging for new semiconductor compounds. These capabilities, now housed in a single cleanroom environment, enable Greene Tweed to deliver the highest quality product with industry standard contamination controls.



Greene Tweed engineers work collaboratively with customers to select materials and design seals that provide superior performance in their specific operating environments. Greene Tweed's broad range of Chemraz® FFKM formulations are utilized by some of the world's leading semiconductor fabs because of their performance and reliability.

Chemraz® sealing solutions are utilized throughout a broad range of mission-critical equipment in key process areas of the world's semiconductor fabs, including etch, deposition, aqueous, subfab, electro-chemical (electroplating), and more. The company's range of integrated solutions leverages bonding, encapsulation, and coating capabilities to provide high performance for critical components.

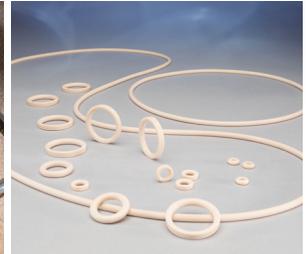
In addition to its elastomeric sealing portfolio, Greene Tweed also manufactures and designs finished components composed of filled and unfilled grades of PEEK, PTFE, and a range of thermoplastic composite materials.



Fusion™ F10



Chemraz® SubFAB



Chemraz® 663

### Deposition Solutions

**Processes:** PECVD, CVD, ALD, HDCVD, epitaxy, oxidation, diffusion, RTP

#### Materials:

- Chemraz® 547 – provides enhanced plasma resistance in fluorine plasma processes. Its novel formulation provides elemental purity, without fillers, to reduce contamination risk
- Chemraz® 513 – recommended for dry process processing applications, providing excellent performance in static plasma, photolithography, and diffusion processes
- Chemraz® 629 – excellent O<sub>2</sub> plasma resistance with low contamination
- Fusion™ F10 – delivers performance similar to high-end polymers in both etch and deposition systems, and can be used in more than 80 percent of fab sealing applications

### Etch Solutions

**Processes:** Conductor etch, dielectric etch, and ash/strip

#### Materials:

- Chemraz® XPE – designed to withstand the harsh chemistries of advanced etch and deposition wafer processing, enabling increased chip yield and equipment productivity
- Chemraz® 657 – provides enhanced plasma resistance and minimal contamination in dry plasma systems
- Chemraz® E38 – specifically designed for high-density plasma systems and diffusion processes where seal reliability and minimal contamination are essential
- Fusion™ F10 delivers performance similar to high-end polymers in both etch and deposition systems, and can be used in more than 80 percent of fab sealing applications

### Aqueous Solutions

**Processes:** Wet etch (acid, base), wet stripping (solvents), wet cleaning (UPDI), electroplating, Chemical Mechanical Planarization (CMP)

#### Materials:

- Chemraz® 571 – Durable compound for wet applications with high sealing loads
- Chemraz® 570 – Minimal particulation and maximum plasma resistance
- Chemraz® 551 – Broad chemical resistance at high temperatures

### Electroplating Solutions

**Processes:** Electroplating and electrochemical deposition

#### Materials:

- Chemraz® 570 – recommended for equipment wet processing applications where stringent seal reliability and contamination control are required

### Subfab Solutions

#### Materials:

- Fusion™ 742 – performs well in aggressive chemicals, with good performance in dynamic and static applications
- Chemraz® SubFAB – designed to resist harsh chemical effluents in aggressive subfab environments

Greene Tweed provides worldwide design and manufacturing expertise and collaborates with customers to develop custom, innovative solutions that meet their challenging performance requirements and reduce total cost of ownership.

For additional information, call +1.215.256.9521, or visit our website at [www.gtweed.com](http://www.gtweed.com).