

SEMICONDUCTOR SOLUTIONS

Deposition



Chemraz®: The Preferred Choice for Semiconductor Sealing Solutions

Greene Tweed's broad range of Chemraz® formulations are utilized by some of the world's leading semiconductor fabs because of their superior performance and reliability. Chemraz® sealing solutions provide customers with an increased MTBR (mean time between repair) to reduce downtime and maintenance costs.

Superior Performance

- Minimal metallic ion content
- Exceptional plasma resistance
- Low particle generation
- High dimensional stability

Operational Benefits

- Superior reliability
- Enhanced repeatability
- Maximum system uptime
- Lower cost of ownership

A Full Range of Materials for Every Fab

Greene Tweed offers a full spectrum of materials to suit the needs of a variety of semiconductor fabs. Greene Tweed has sealing solutions for fabs utilizing the most advanced technology nodes in the most aggressive operating environments, as well as those requiring less stringent particle process controls.

Technology Node	Material	Compression Set @25% Deflection - %	Max Service Temperature
10 nm and below	Chemraz® XPE Superior O ₂ plasma resistance to protect components	70 hours @ 240°C 22%	280°C
	Chemraz® 629 Excellent O ₂ plasma resistance with low contamination	70 hours @ 204°C 30%	260°C
	Chemraz® XCD Superior thermal resistance; carbon-loaded	70 hours @ 300°C 32%	300°C
10 nm - 45 nm	Chemraz® XRZ Exceptional plasma resistance in corrosive environments	70 hours @ 300°C 17%	300°C
	Chemraz® 513 Universal compound for conventional applications	70 hours @ 204°C 25%	210°C
	Chemraz® XTR Superior resistance to corrosive CLF3 cleaning environments	70 hours @ 300°C 31%	300°C
	Chemraz® 655 High temperature perfluoroelastomer with minimal particle generation	70 hours @ 204°C 15%	315°C
> 45 nm	Fusion™ 764 High performance at a low cost of ownership	70 hours @ 204°C 27%	220°C
	Chemraz® 550 Carbon-loaded, basic perfluoroelastomer	70 hours @ 204°C 25%	210°C



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Process	Typical Application Temperatures	Process Environments	Recommended Products
PECVD/ALD	25 – 300°C	TMS, DEMS, TEOS, SiH ₄ , C ₃ H ₆ , NH ₃ , SiF ₄ , O ₂ , N ₂ O, NF ₃	Chemraz® XPE, 629, XRZ, XCD, 513, 550 Fusion™ 764
HDPCVD	25 – 300°C	TEOS, SiH ₄ , NH ₃ , SiF ₄ , O ₂ , C ₂ F ₆ , N ₂ O, NF ₃ , CF ₄	Chemraz® XPE, 629, XRZ, XCD, 513, 550 Fusion™ 764
Metal CVD/ ALD/LPCVD	25 – 300°C	Organic Precursors, WF ₆ , TiCl ₄ , SiH ₄ , HF, F ₂ , Cl ₂ , ClF ₃ , NF ₃ , H ₂ O vapor, O ₂ , O ₃	Chemraz® XPE, 629, XRZ, XCD, 513 Fusion™ 764
Oxidation Diffusion	150 – 300°C	N ₂ , O ₂ , H ₂ O, HCl, Cl ₂	Chemraz® XCD, XTR, 655

Dynamic Applications	Static Applications
Door Seals Valves	Chamber Seals Lid Seals Quartz Chamber Seals Fittings Gas Inlet/Outlet/ Mixing Block Seals Window Seals Center Rings

The Greene Tweed Advantage

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

Greene Tweed leverages decades of engineering and applications expertise to design customized solutions, including material selection and hardware design based on specific operating environments, such as the oxygen- and fluorine-intense etch and deposition processes.

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Statements and recommendations in this publication are based on our experience and knowledge of typical applications of this product and shall not constitute a guarantee of performance nor modify or alter our standard warranty applicable to such products.

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