

Perfluoroelastomers for Semiconductor Service

Parofluor ULTRA™ materials are high performance perfluoroelastomers specifically designed for use in a variety of harsh operating environments within the semiconductor industry. *Parofluor* ULTRA™ performs in applications where superior thermal stability, chemical resistance and ultra high-purity are required.

The table below contains detailed information about the physical properties and performance capabilities of *Parofluor*™ materials. Refer to the chart on the back of this sheet for specific process information.



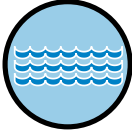


Parofluor ULTRA™ Materials Offering

Parker Compound	Color	Nominal Hardness (Shore A)	Temperature Range	Features
FF200-75	Black	75	-15°C to 320°C 5°F to 608°F	Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet process chemistries.
FF350-75	White	75	-15°C to 316°C 5°F to 600°F	High purity, low outgassing, low particle generation. Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
FF352-75	White	75	-15°C to 316°C 5°F to 600°F	Clean. Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
FF354-65	White	65	-15°C to 316°C 5°F to 600°F	Lowest closure force for static sealing applications. High purity, low outgassing, low particle generation. Excellent thermal stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
FF356-75*	White	75	-15°C to 316°C 5°F to 600°F	Applications for rubber bonded to metal or plastic. High purity, low outgassing, low particle generation. Excellent thermal stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
FF370-75	Translucent Black	75	-15°C to 275°C 5°F to 525°F	Non filled, high purity. Low particle generation. Outstanding compression set resistance and mechanical properties.
FF500-75	Black	75	-15°C to 275°C 5°F to 527°F	Best chemical resistance for all types of wet process chemistries. Outstanding compression set resistance and mechanical properties.

* Ideal for use in composite (rubber-to-metal/plastic) sealing configurations, such as UHP Slit Valve™ and UHP Gate Valve™ Doors.

Parofluor™ Compound/Semiconductor Process Guide

	Process Type	Temperature Range °C / °F	Requirements	Typical Applications	Suggested Compounds	Material Comments
 <p>Plasma and Gas Deposition</p>	Etching	25°C-225°C 77°F-437°F	Fluorine/Chlorine/O ₂	Static Seals: Lids Endpoint Windows Chambers Gas Inlets KF Centering Rings Flanges Dynamic Seals: Slit Valve Doors Mass Flow Controls Throttle Valves Isolator Valves Exhaust Valves Fittings	Best: FF350-75 FF370-75 Alternative: FF352-75	FF200-75 Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet process chemistries. FF350-75 High purity, low outgassing, low particle generation. Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes. FF352-75 Excellent continuous high temperature stability. Oxygen plasma environments. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
	Ashing	25°C-250°C 77°F-482°F	O ₂ /O ₃ /H ₂ O			
	HDPCVD/ PECVD/ CVD	25°C-250°C 77°F-482°F	TEOS/O ₃ , SiH ₄ /O ₂ , NF ₃ /C ₂ F ₆ /CF ₄			
	PVD	25°C-250°C 77°F-482°F	Ar, High Vacuum			
	Metal CVD	25°C-250°C 77°F-482°C	TEOS/O ₃ , SiH ₄ /O ₂ , NF ₃ /C ₂ F ₆ /CF ₄ ,WF ₆ / ClF ₃			
	Copper	25°C-250°C 77°F-482°F	TEOS/O ₃ , SiH ₄ /O ₂ , NF ₃ /C ₂ F ₆ /CF ₄ ,WF ₆ / ClF ₃			
	ALD	25°C-250°C 77°F-482°F	O ₂ /O ₃ /H ₂ O,NF ₃ / CF ₄ ,ClF ₃			
 <p>Thermal</p>	Oxidation/ Diffusion	150°C-300°C 302°F-572°F	N ₂ /O ₂ /H ₂ O	Static Seals: Lids Endpoint Windows Chambers Gas Inlets KF Centering Rings Flanges Quartz Chambers Bell Jars Dynamic Seals: Slit Valve Doors Mass Flow Controls Throttle Valves Isolator Valves Exhaust Valves Fittings	Best: FF200-75 FF350-75 FF356-75* Alternative: FF352-75	FF354-65 Lowest closure force for static sealing applications. Excellent continuous high temperature stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes. FF356-75* For use in applications requiring rubber bonded-to metal/plastic. High purity, low outgassing, low particle generation. Excellent thermal stability. Outstanding compression set resistance and mechanical properties. Broad chemical resistance for wet and dry processes.
	LPCVD	150°C-300°C 302°F-572°F	NH ₃			
	RTP	150°C-300°C 302°F-572°F	IR Resistance/ Low Outgassing/ Thermal Stability			
 <p>Wet</p>	Surface Prep, Cleaning, Rinse	25°C-125°C 77°F-257°F	UPDI,SC-1,HF,HCL	Static Seals: Lids Chemical Containers Chemical Baths Dynamic Seals: Pumps Valves Connectors Flow Meters Filters Contact Rings Thrust Plates	Best: FF500-75 Alternative: FF200-75 FF350-75	FF500-75 Best chemical resistance for all types of wet process chemistries. Outstanding compression set resistance and mechanical properties. FF370-75 Black translucent, non filled, low particle generation and cost effective.
	Wet Etching	25°C-180°C 77°F-356°F	HF, UPDI, H ₂ SO ₄			
	Photolithography, Developing, Rinse	25°C-125°C 77°F-257°F	nMP, H ₂ SO ₄ , NaOH			
	Wet Strip	25°C-125°C 77°F-257°F	nMP, H ₂ SO ₄ , NaOH			
	Copper Plating	25°C-100°C 77°F-212°F	CuSO ₄ , H ₂ SO ₄ , UPDI			

*Ideal for use in composite (rubber-to-metal/plastic) sealing configurations, such as UHP Slit Valve™ and UHP Gate Valve™ Doors.

Total System Solutions: Parker's Seal Group offers a complete line of O-rings, custom molded shapes, composite (rubber bonded-to-metal/plastic) seals, PTFE and thermoplastic seals, bumpers, dust covers, diaphragms, isolators, washers and thermoset injection molded boots and bellows for a wide variety of applications. Parker's "total systems sealing" approach can help customers reduce costs and improve efficiency.

Refer to www.parkerorings.com for additional information, or contact a Parker Applications Engineer at 859.269.2351 for assistance.



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