

SEMICON MANUFACTURING SOLUTIONS

Material Reliability, Fab Performance. Under Control.

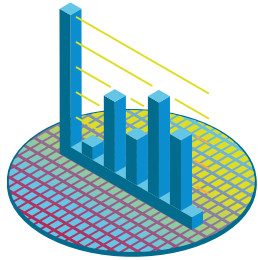
Supporting uptime, throughput,
and process stability in critical
semicon environments.

Discover how material
selection impacts
fab economics

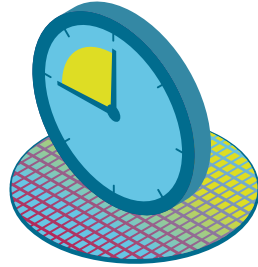


Material Reliability Impacts Your Bottom Line

Manufacturing Pressures in Advanced Semiconductor Fabs



Yield improvement under aggressive ramp and throughput targets



Tighter process windows at advanced nodes



Equipment uptime directly tied to cost of ownership



THE MATERIAL RISK

Unproven materials in critical process tools introduce unnecessary variables during qualification and ramp - extending time-to-volume, increasing defect risk, and driving up total cost of ownership.

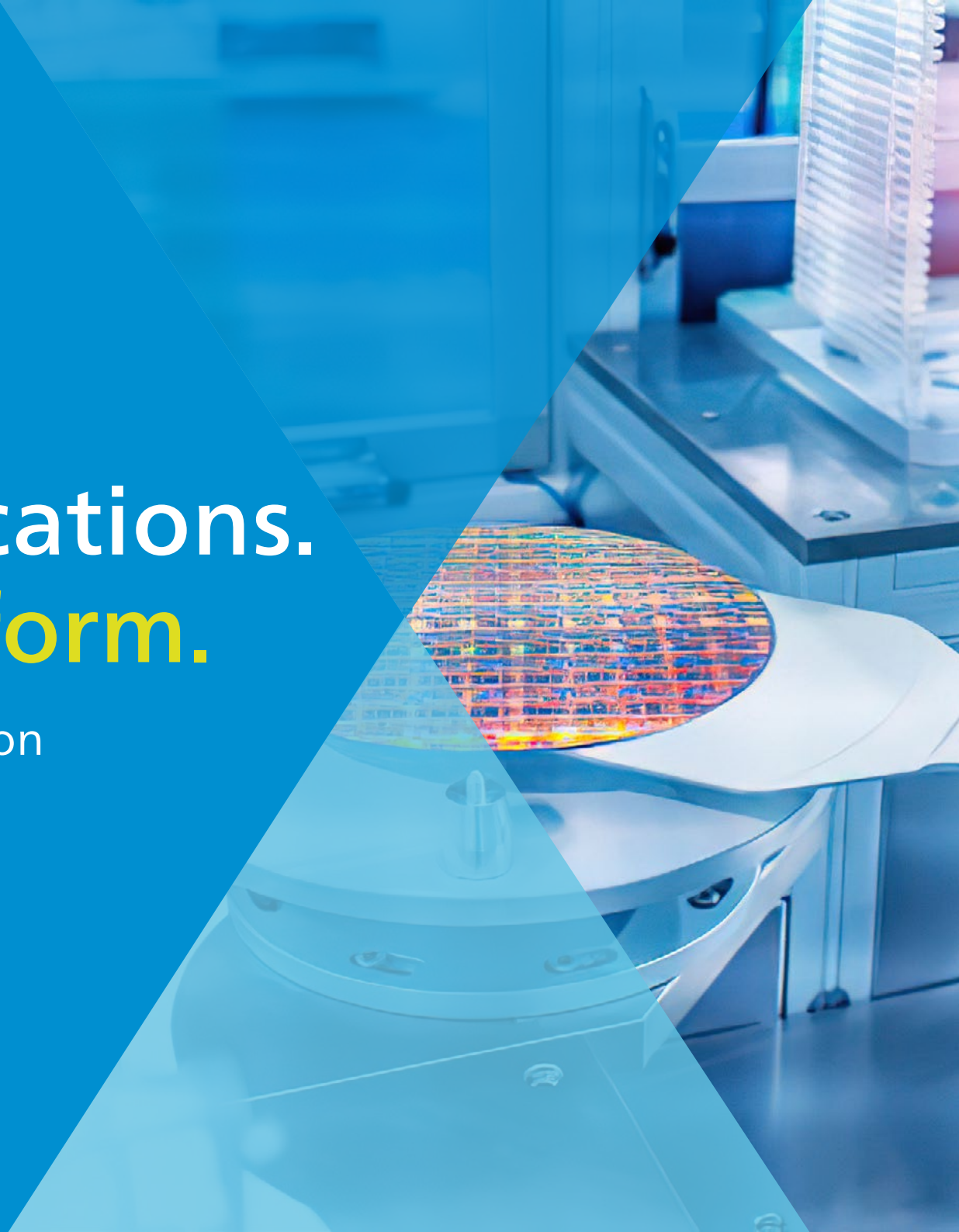
THE VICTREX SOLUTION



VICTREX PEEK polymers deliver production-proven performance backed by decades of use in global high-volume semiconductor manufacturing. Validated performance from qualification through volume production.

3 Critical Applications. 1 Material Platform.

A proven, reliable material solution



CMP RETAINING RINGS

FOUPs

RETICLE SMIF PODS



Supporting Consistent Planarisation in Advanced Nodes

Chemical Mechanical Planarisation (CMP) retaining rings operate in one of the most aggressive environments in semiconductor manufacturing, where wear, dimensional stability, and purity directly impact wafer yield and tool uptime.



MANUFACTURING PRESSURES

- Abrasive chemical slurries and continuous mechanical friction
- Increasing CMP steps per wafer at advanced nodes
- Higher mechanical loads with larger wafer formats
- Extending consumable lifetime and reduce downtime



WHY VICTREX™ PEEK

- High wear resistance supporting longer service life
- Dimensional stability under mechanical and thermal stress
- Low particle generation supporting contamination control

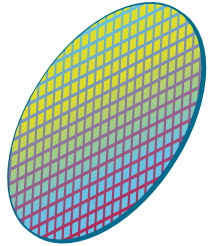


CMP retaining rings made with VICTREX PEEK polymers have demonstrated up to **~2.5% productivity improvement** and up to **2x wear resistance compared with PPS**, depending on process conditions.

CMP RETAINING RINGS

FOUPs

RETICLE SMIF PODS



Protecting Wafers Across Automated Manufacturing

FOUPs function as mobile mini-environments, protecting wafers during storage, transport, and automated handling across multiple process steps.



MANUFACTURING PRESSURES

- Continuous exposure to cleanroom environments
- 24/7 automated handling via overhead hoist transport (OHT) systems
- Repeated mechanical stress from robotic interfaces
- Longer storage times at advanced nodes



WHY VICTREX™ PEEK

- Supporting shorter turnaround time by enabling handling of higher-temperature wafers without extended cooling delays – improving fab throughput
- Low particle generation supporting contamination control
- Mechanical durability for high-cycle automation
- Stable performance in cleanroom and inert environments

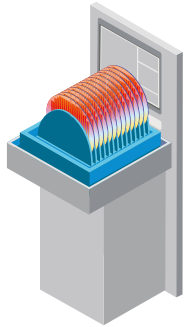


Reduced fab turnaround time by enabling handling of higher-temperature wafers without extended cooling delays. **Extended carrier service life supporting** lower total cost of ownership in high-volume production.

CMP RETAINING RINGS

FOUPs

RETICLE SMIF PODS



Protecting High-Value Photomasks

Reticles represent some of the most valuable assets in semiconductor manufacturing. Material selection for RSPs directly impacts contamination control, mask lifetime, and lithography stability.



MANUFACTURING PRESSURES

- EUV lithography driving increased sensitivity to contamination
- Risk of haze formation from airborne molecular contamination
- Requirement for ultra-low outgassing materials
- Seamless integration with automated load ports



WHY VICTREX™ PEEK

- Low outgassing & low metal ions characteristics
- Chemical resistance supporting contamination control
- Reliable performance across automated storage, transport, and handling systems



Proven contamination control supporting lithography tool uptime and reticle lifetime in advanced node production.

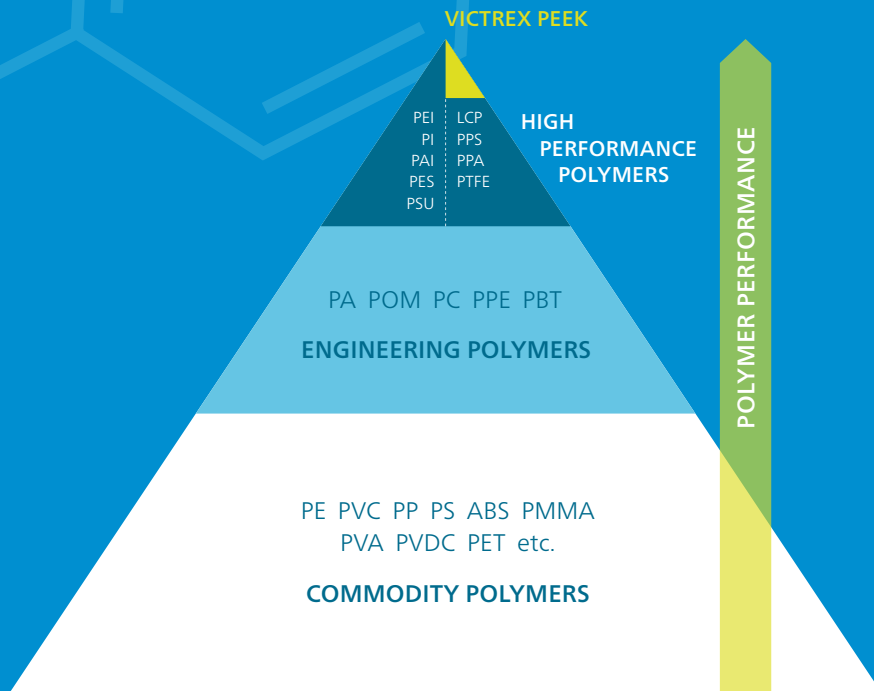
One Material, Multiple Benefits

A deep dive into PEEK Polymers



What is PEEK?

Polyetheretherketone (PEEK) is one of the highest performing thermoplastics in the world, widely used in demanding industrial environments where mechanical strength, wear and chemical resistance, thermal stability, and cleanliness are required simultaneously.



[LEARN MORE](#)



For semiconductor manufacturing, VICTREX™ PEEK enables a balanced material solution across multiple critical applications, reducing qualification complexity and material risk.

Validated Performance at Scale

What VICTREX PEEK delivers

✓ CMP Operations

- ~2.5% productivity improvement through extended component life
- Up to 2x wear resistance vs. PPS, enabling longer replacement intervals
- Reduced maintenance frequency supporting higher tool uptime

✓ FOUP/Carrier Systems

- Higher-temperature wafer handling improves throughput
- Low particle generation for contamination control
- Dimensional stability protects wafers

✓ RSP/Reticle Protection

- Low outgassing minimizes contamination
- Maintains storage environment purity
- Proven reliability for critical lithography assets

308+ MILLION

wafers transported in FOUP (Front Opening Unified Pods) made with VICTREX PEEK



2.5+ BILLION

wafers polished with CMP (Chemical Mechanical Planarisation) retainer rings made with VICTREX PEEK

425,000+

critical reticles stored and transported in RSP (Reticle SMIF Pods) made with VICTREX PEEK

[LEARN MORE](#) 

From Specification to Production Support

With 40+ years of focus on PEEK and PAEK polymers, Victrex supports customers from early material selection and feasibility assessment through qualification and high-volume production, helping reduce development risk and accelerate time-to-volume.

Complete Solution Portfolio

From base polymers to polymerisation to finished products.

Unmatched PEEK Technical Knowledge

- Material Selection
- Feasibility Analysis
- Process Optimisation
- Design-for-Manufacture
- Polymer Database

A Trusted Supplier

8,000T/PA

The largest PEEK capacity to global quality standards.

Application Development Expertise

Enabling customers to overcome complex design & engineering challenges to accelerate the development of innovative, sustainable applications across key markets.

World's only vertically integrated PEEK/PAEK manufacturer, ensuring consistent quality, reliable supply, and long-term stability.

Your Competitive Advantage

- ✓ Faster Development
- ✓ Reduced Risk
- ✓ Reliable Supply

[LEARN MORE](#) 



A World Leader in PEEK and PAEK Polymer Solutions

Victrex is an innovative world leader in high performance polymer solutions, focused on the strategic markets of automotive, aerospace, energy (including manufacturing & engineering), electronics and medical. Every day, millions of people use products and applications, which contain our materials – from smart phones, aeroplanes and cars to oil and gas operations and medical devices. With over 40 years' experience, we develop world leading solutions in PEEK and PAEK-based polymers, semi-finished and finished parts which shape future performance for our customers and our markets, and drive value for our shareholders. Find out more at www.victrex.com

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