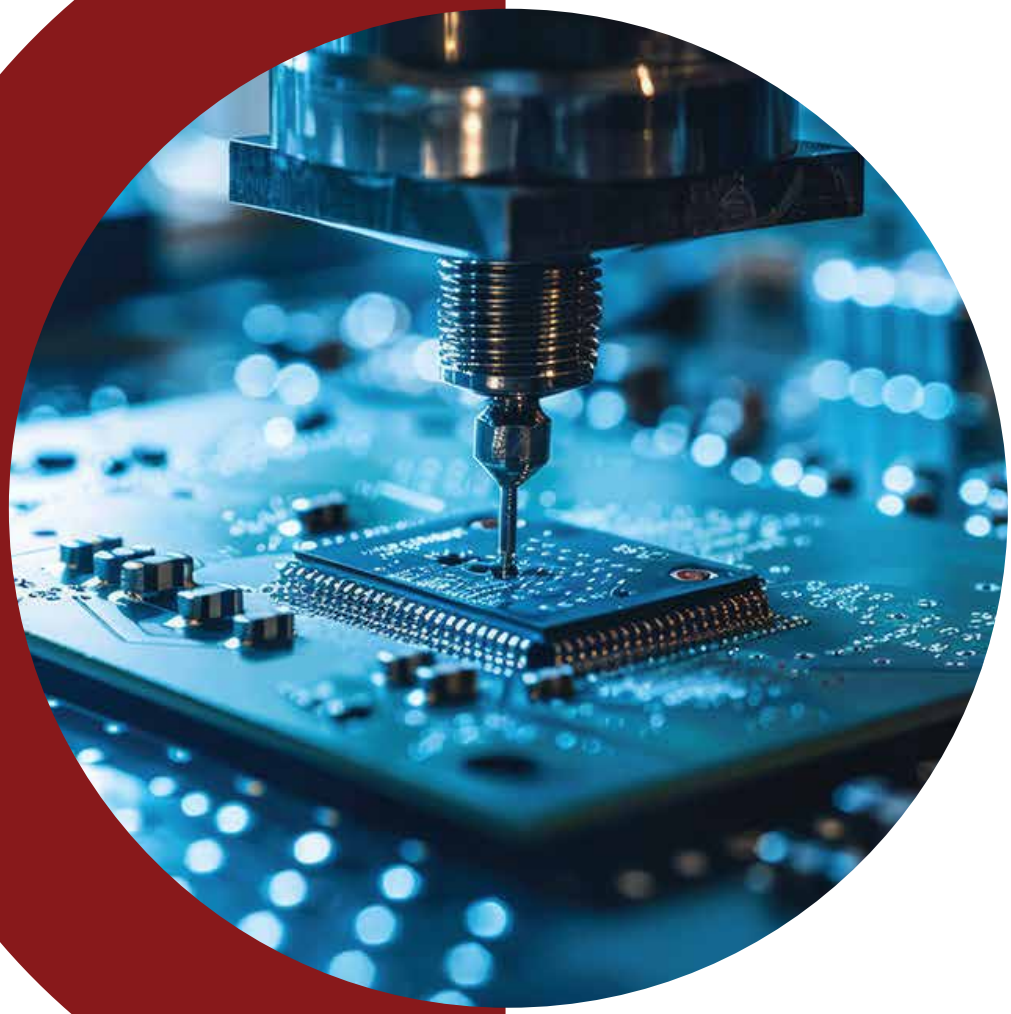
SEMI-CONDUCTOR INDUSTRY

SURLON INDIA



SEMICONDUCTOR & ELECTRONICS

Surlon
Vision | Innovation | Engineering

Semiconductor & Electronics: Material Solutions & Key Properties

The miniaturisation of IC devices is pushing the back-end test industry to explore the limits of polymeric materials. As these devices become smaller, not only do their overall sizes shrink, but the required cross sections also become thinner. This evolution in scale creates a significant challenge: selecting materials that are stiff enough to withstand rigorous testing conditions while still being machinable at micro-scale dimensions. With increasing I/O counts and reduced spacing between connection points, engineers must ensure that the materials used can support smaller hole diameters, finer pitch sizes and ultra-thin profiles without compromising the structural integrity or the manufacturability of the end device.

Critical Properties to Improve its Machinability and Stability:

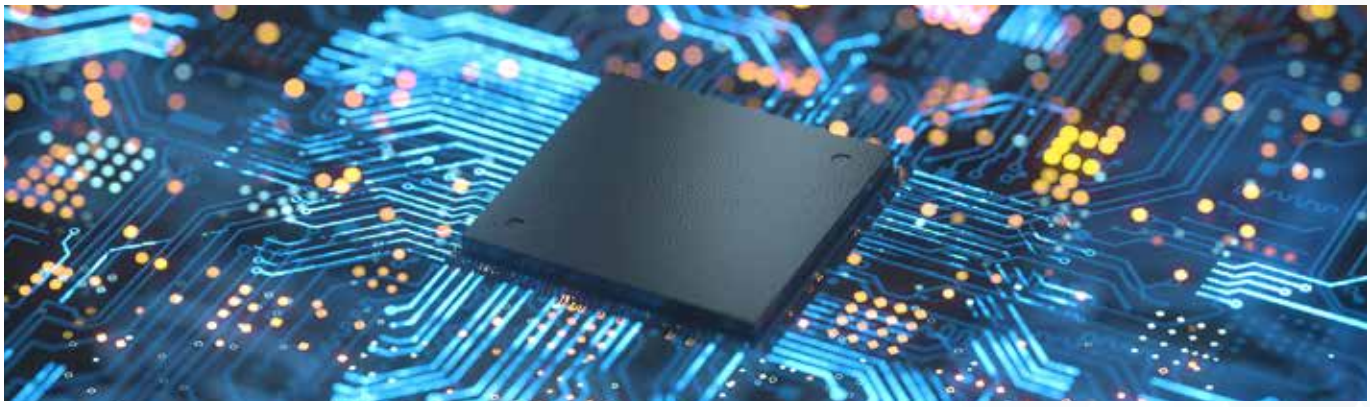
FLEXURAL MODULUS
Critical for managing the robustness of the finished socket under test conditions

POLYMER MELTING POINT
Critical for clean thru holes during drilling

TENSILE ELONGATION
Critical for controlling the accuracy of holes during machining

CLTE
Critical for providing dimensional stability over avaried temperature range during usage

MOISTURE ABSORPTION
Critical for maintaining dimensional stability



Semiconductor & Electronics: Material Solutions & Key Properties

Building on the critical property requirements outlined earlier– such as flexural modulus, CLTE, and moisture resistance SURLON offers a curated selection of high-performance polymers tailored for specific functions in semiconductor manufacturing. These materials are engineered to maintain structural integrity and precision under thermal, mechanical, and environmental stresses. The following product grades are designed to meet the unique challenges of IC testing, fixturing, and component fabrication across back-end and cleanroom processes.

Material Overview

- Excellent dimensional stability and low moisture absorption
- High machinability, suitable for tight tolerances
- Resistance to heat, wear and chemical exposure
- ESD properties tailored for semiconductor handling
- Available in plates and rods for varied machining needs

Material Grades & Applications

POLYTUFF® (PPH)
Developed specifically for the semiconductor and electronic industry, this material is completely free from porosity, center line, and contamination. Annealed in a controlled environment, it delivers lower stress plates ideal for precision components.

METALON® (PA-ESd)
This cast polyamide is modified to perform in harsh semiconductor environments, offering high purity and ease of machining. Available in multiple rod and plate sizes, it meets tight tolerance requirements in demanding electronic applications.

METAPOM® (POM-ESd)
A top choice for fixtures, test jigs, and tooling, METAPOM® offers high dimensional stability, superior stiffness, and strength with very low moisture absorption. It's easily machinable and preferred for high-precision parts.

METRON (PEEK-ESd)
Designed for high-temperature and structurally demanding applications, METRON provides a very low CLTE across a broad temperature range. It's extremely rigid, chemically resistant, and stable under thermal and mechanical stress.

METRON (PAI)
Optimised for vacuum chamber parts, METRON (PAI) offers outstanding heat resistance and low erosion in plasma environments. With low ionic content and outgassing, it's ideal for critical applications requiring clean, high-precision machining.



Note:

*Each material above has been designed to support smaller geometries, finer pitches, and thinner cross-sections– meeting the latest standards in semiconductor test socket engineering.

Semiconductor & Electronics: Advanced Materials for Vacuum Chamber

Vacuum chambers now operate under increasingly aggressive plasma chemistries, higher energy levels and stricter contamination controls. Materials used in these systems must not only withstand high heat and chemical exposure but also deliver ultra-low ionic content and outgassing. SURLON offers advanced materials specifically developed to meet the rigorous demands of vacuum chambers.

The introduction of oxygen-rich chemistries, the push for reduced node sizes, and the limited tolerance for erosion or contamination are driving innovation. Our materials are designed to replace traditional solutions like polyimide, ceramics, and quartz, providing improved durability with reduced risk of breakage and improved machining flexibility.

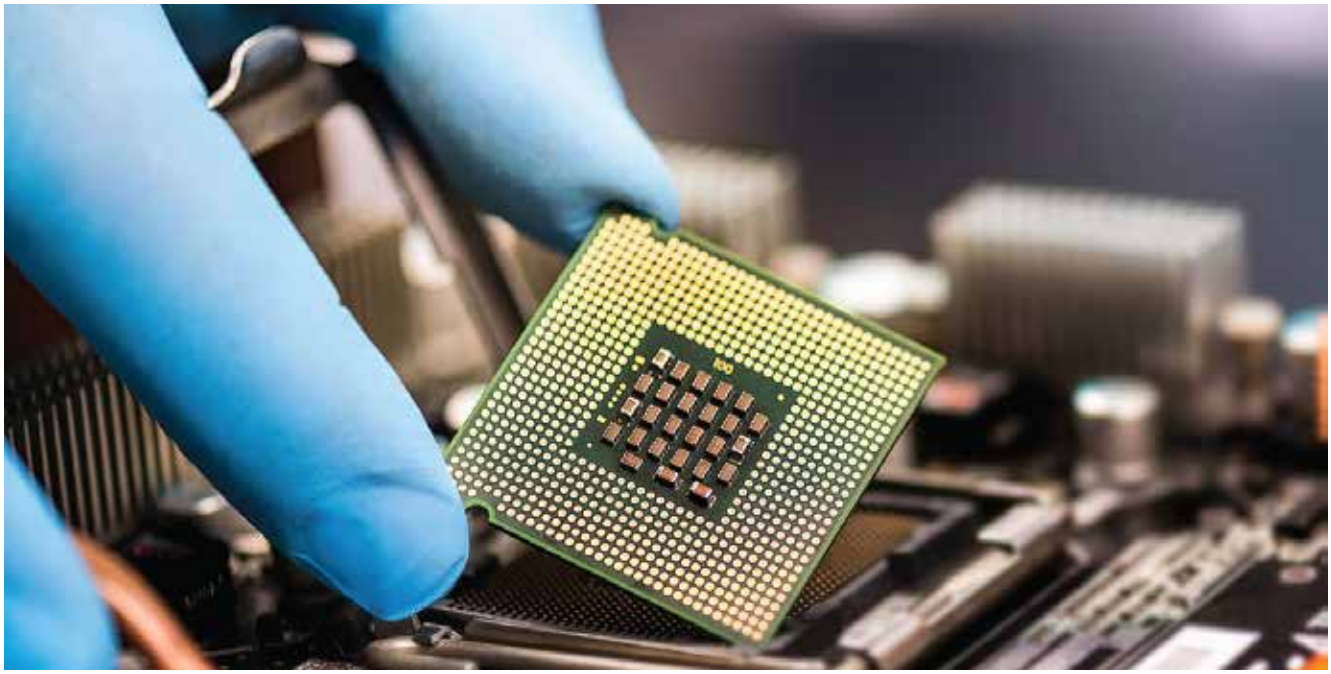
Key Considerations

- Increased energy in plasma chambers
- Use of aggressive chemistries, including oxygen
- Application-specific material selection to optimize cost vs. performance
- Replacement of traditional polyimide for better economics
- Controlled use of ceramics & quartz due to breakage/cost risks
- Higher ionic purity requirements with shrinking node sizes

Typical Applications

- Screws & pins
- Clamp & trench rings
- Valve housings
- Shower heads
- Etch and CVD components

These components demand materials that offer not just mechanical strength, but also purity, thermal resilience, and dimensional stability under plasma exposure, qualities our polymers are specifically designed to deliver.



Semiconductor & Electronics: Advanced Materials for Wet Process Applications

Wet processing in semiconductor manufacturing requires materials that can endure continuous exposure to aggressive chemicals, deionized water, and mechanical wear– without compromising flatness, dimensional accuracy, or cleanliness. Surlon's advanced materials for wet process applications are engineered to resist corrosion, maintain strength, and minimize contamination risks. These materials are particularly suited for wafer handling, support components, and precision chemical process parts used in cleanroom and sub-fab environments.

Key Considerations

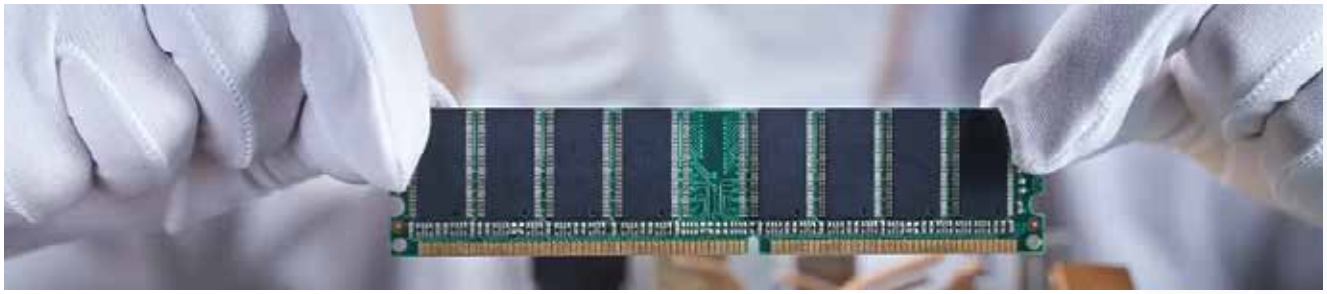
- Corrosion resistance
- Flatness
- Strength & wear
- Purity
- Chemical resistance
- Dimensional strength

Typical Applications

- Spin discs & chucks
- Wafer motion gears
- Shower heads
- Wafer grabbers
- Pins & screws

Key Benefits

- Minimizes center line porosity common in thick plates (2" & up)
- Delivers ultra-clean plates to reduce risk of surface contamination
- Lowers overall cost by providing low-stress plate material



Minimal Center Line Porosity

Surlon has developed proprietary processing methods to significantly reduce the high stress and center line porosity often seen in standard polypropylene plates. This makes our material ideal for wet process components that require thicker stock, ranging from 2" to 5", while still maintaining cleanliness and dimensional stability.

Get in Touch with Us

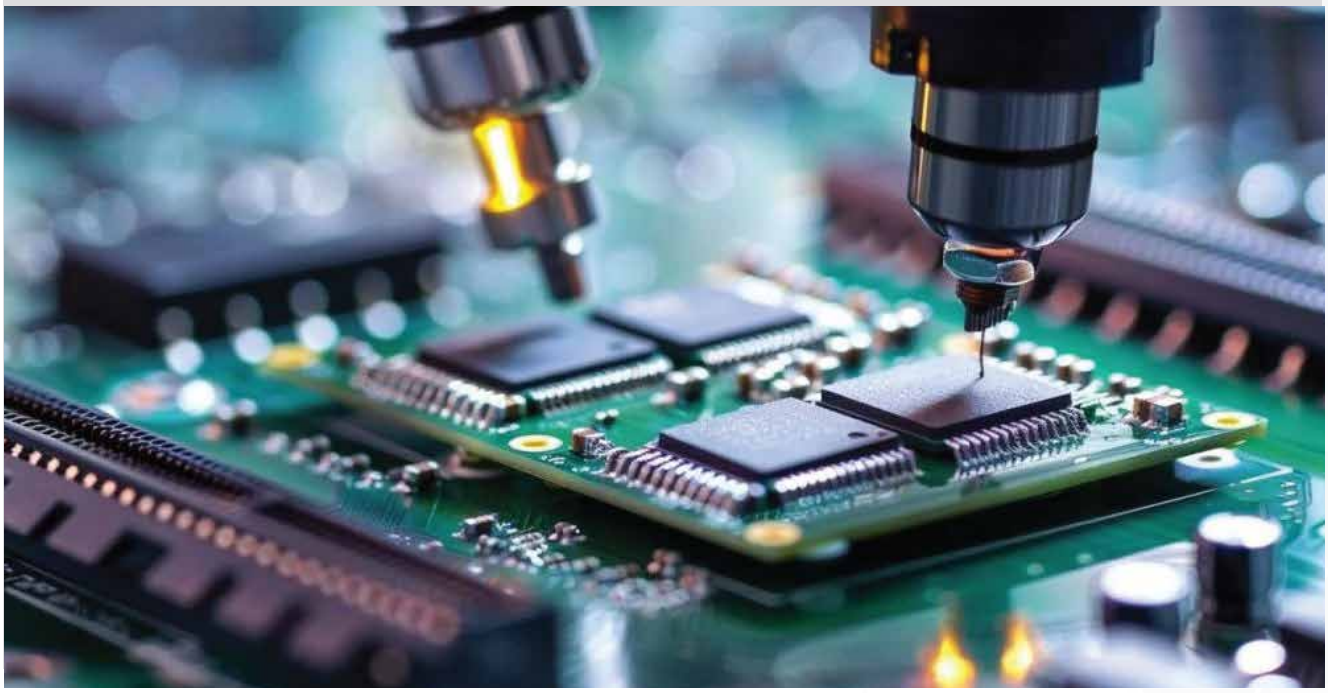
Let's Build Precision Together

Whether you're developing next-generation IC test sockets, vacuum chamber components, or wet process parts, our team is here to help you choose the right material for every stage of your semiconductor application. Reach out to us for technical support, custom solutions, or detailed product information.

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