

# Semiconductor Manufacturer Achieves Prototype-to-Production in Six Months

## — THE PROBLEM

A large-scale semiconductor manufacturer was developing a critical component for their integrated circuit production process. The part was designed to withstand extreme temperatures, precise tolerances, and high wear and tear in a cleanroom environment. However, the material selection for the prototype failed to meet several key performance requirements. The existing material couldn't handle the thermal stress, leading to premature degradation and reduced reliability in the final product. Additionally, the material's surface characteristics did not align with the stringent cleanliness standards required in semiconductor manufacturing. Despite several iterations, the engineering team struggled to find a material that would meet the tight tolerances and performance demands. This left them at a standstill, unsure of how to proceed with the component's development, threatening the project's timeline.

## — THE SOLUTION

MPC stepped in with a custom polyurethane formulation designed to meet the exacting standards of the semiconductor industry. After thorough consultations with the engineering team, MPC developed a material that was specifically engineered for high thermal stability, low friction, and exceptional durability under harsh conditions. The new formulation also featured a smooth, cleanable surface that complied with the cleanliness standards of the semiconductor environment. MPC's team of experts worked closely with the customer to ensure the material met the required tensile strength and flexibility while providing consistent performance across all production cycles. Prototype samples were produced quickly, enabling the engineering team to test the material's performance in real-world conditions. Within a matter of weeks, MPC was able to deliver the custom formulation that surpassed the customer's expectations.

### MARKET

Industrial

Semiconductor  
Manufacturing

### SOLUTION

Protection & Dampening

Media Handling

### PRODUCT

Micro-Molded Products

### TECHNICAL SPECIFICATIONS

#### MATERIAL

Custom polyurethane  
formulation

#### KEY PROPERTY

High thermal stability, low  
friction

#### PROCESS

Cast molding, precision  
machining

#### ENVIRONMENT

Cleanroom, high-wear, tight  
tolerance

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THE RESULT

Before engaging with MPC, the design engineer had hit a major roadblock in material selection and was struggling to find a solution that met the performance and quality specifications required for the project. MPC’s custom-formulated polyurethane material successfully addressed all the challenges, meeting both the stringent performance and cleanliness requirements. Within weeks, MPC provided prototype samples, allowing the engineering team to conduct thorough testing. Within the first six months, MPC had delivered the production parts in full quantity, closing the project and allowing the design team to focus on their next phase of innovation. The collaboration not only ensured the success of the current project but also strengthened the customer’s confidence in MPC’s ability to deliver tailored material solutions. The result was a seamless transition from prototype to production, with consistent quality and performance, helping the customer achieve their ambitious goals in semiconductor manufacturing.

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|---------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|
| <div>6 mo</div> <div>PROTOTYPE TO FULL PRODUCTION</div> | <div>Weeks</div> <div>TO FIRST PROTOTYPE SAMPLES</div> | <div>Full</div> <div>PRODUCTION QUANTITY DELIVERED</div> |
|---------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|

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