

# PRECISION MOLDING



Getting It Right The First Time

## Important Factors

Precision injection molding ensures a molded component is repeatable every time, from lot to lot, regardless of the annual production volumes. However, not every molder provides the same level of experience/awareness or fully embraces the use of scientific molding principles in their pursuit of high-quality parts. There are several critical factors that need to be considered for success with an injection molding project, including choosing the right partner who: understands the entire development process, can participate in the part design & the material selection, and can properly manage the tool design.



### The Right Partner

Choosing the right manufacturing partner is an important first step in creating a quality molded product. Engaging the right partner from the start will minimize potential issues throughout the commercialization process.



### The Right Design

Precision molding begins with good part design and a knowledgeable partner that will spend the time to review each part to ensure it is manufacturable.



### The Right Material

Selecting the right resin can be crucial to precision molding. Equally important, is choosing a manufacturing partner with experience in processing all grades of thermoplastics resins.



### The Right Tool

There are different types of tools for different stages of development. Your manufacturing partner will assist in devising a tooling plan as well as managing the many details associated with proper tool design.

For More Information  
**Contact us:**

# The Right Partner

A manufacturer that specializes in precision molding, with in-depth knowledge of tooling and the molding process, can reduce development costs and prevent delays in product release. Finding a contract manufacturer (CM) with experts in multiple disciplines (design, manufacturing, tooling, and quality) can facilitate material selection, reduce part complexity and tooling costs, and improve the part-qualification process by recognizing tolerance issues earlier in the process. Engaging the proper partner from the start will minimize potential issues throughout the commercialization process.

# The Right Design

A knowledgeable molding partner can assess manufacturability, and make suggestions for how to revise the model to improve tooling conditions. Beyond the 3D geometry, the part drawing holds the key to success for the manufacturer. Establishing proper datum schemes, applying tolerances that grow with feature size, and specifying characteristics that are attainable (e.g. sufficient flash, gate vestige, particulate allowances) will help keep project costs and timelines in control.

# The Right Material

Selecting the right resin is another critical factor for production of precision parts. The options are sometimes limited to predicate devices, but when possible, the CM may be able to suggest the best fit for the application.

Important Factors:

- Expected service life - is the device reusable or disposable?
- Service environment - will it be exposed to chemicals, high stresses, or high temperatures?
- Sterilization method - will gamma radiation discolor the resin?
- Relation to other parts - are there moving parts or tight fits?

Tolerances and form - will the material induce warp or changes in shrink rate?

A partner knowledgeable in the properties of all types of thermoplastics can facilitate the early selection of a material that is properly suited to each part/device.

# The Right Tool

A good manufacturing partner will consider the customer's short- and long-term sales goals, and will recommend an appropriate tooling plan which may involve: true prototype tools to aide in part-design verification; bridge tools to allow fully qualified entry to the market without high capital costs; and/or multi-cavity tools to ensure production volumes or price targets can be met.

There are numerous factors the tool shop and the molder must consider to achieve optimal parts, such as ensuring good cooling and venting, proper ejection, and gate location/style/size to minimize warpage or cosmetic issues. The more complex the part, the more 'action' the tool will have, and the more considerations must be made for long-term wear and serviceability.

With proper tool design and solid craftsmanship, the process engineer will have the best opportunity to establish a robust molding process. Coupled with a good tool-maintenance program, the experienced CM will provide consistent part quality over long periods of time.