

The background image shows a large industrial injection molding machine in a factory setting. A worker is visible on the left, looking at a control panel. The machine has various components, including a large vertical cylinder on the right and a complex network of pipes and hoses. The scene is lit with a strong blue light, creating a professional and technical atmosphere. The machine has labels such as 'MI747 Krauss Maffei' and 'KraussMaffei'.

KAYSUN

INJECTION MOLDING & ENGINEERING SOLUTIONS



Injection Molding Project Considerations Part 1:

PRE-PRODUCTION

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Injection-molded parts are used in a wide range of industries and applications.

Tight tolerances, sophisticated geometries, and other complexities must be carefully managed to ensure top quality, performance, and reliability.



Expectations are high. Meeting them requires working with an injection molder that takes the responsibility seriously and has pre-production processes in place to understand, analyze, and coordinate all aspects of your project for successful outcomes. Critical evaluation and collaborative problem solving during initial design and engineering means fewer injection molding issues, less rework, and ultimately getting to market faster.

Be wary of injection molders that want to rush your project to production for the sake of increasing speed to market. The intention may be good, but proceeding without a solid grasp of part characteristics and functionality, resin requirements, and other important project details could prove costly in the long run.



What to look for in a true injection molding partner



Time is of the essence on any injection molding project. How a molder invests that time during the initial phase of a project demonstrates their level of commitment to quality outcomes.

Collaborative decision making and cultivating trust are paramount. Insist on working with an injection molder that will:

- Listen intently to your project goals
- Ask clarifying questions to thoroughly understand project scope
- Engage with your internal team(s) to gather input, test hypotheses, and work toward the best solution
- Offer well-informed perspectives and possibilities that challenge the status quo to improve project efficiencies and product quality
- Remain flexible and adaptive to changes in project scope, circumstances, and needs





Pre-production phase: 3 essential categories for consideration



Pre-production needs are unique to each injection molding project, but they typically fall into three categories:

1 *Engineering and Advanced Testing*

Identifying potential moldability issues and solutions can't — and shouldn't — be done in a silo. **In pre-production:**

- **Cross-functional teams** comprised of customer and injection molding engineers ensure ongoing collaboration and communication
- **Guesswork often means rework.** Aligning engineering with production during the initial design phase involves detailed review and specialized testing by the molder, including:
 - **Design for Manufacturability (DfM) analysis** to evaluate the part design and assess how a part is intended to interact with tooling. Mold simulation software is used within DfM to identify risks and design tooling to efficiently overcome these challenges
 - **Scientific molding software and methodologies** may be used in conjunction with DfM to gather material-specific data that inform decisions about variables to consider prior to production, molding process controls, and process benchmarking to ensure consistent, repeatable outcomes

2

Materials Selection

In custom injection molding, nothing is left to chance – including the resin used. Depending on the project, finding a material that fits the application criteria and optimizes part design can take some time. Assessing the project from a materials perspective as early as possible in the design phase is essential.

Injection molders that are the most helpful in resin selection offer:

- **Familiarity** with the 25,000 engineering grade materials available, and the extended blends, hybrids, and formulations
- **A deep understanding** of the correlation between resin characteristics, molding behaviors, and the benefits a part derives from them
- **Practical experience** with certain resins that amplify and often exceed manufacturer spec information

3

Purchasing Best Practices

While injection molding partners don't control customers' purchasing practices or decisions, they can exert great influence through:

- **Planning:** An injection molder with broad-based experience typically has historical data about project costs that can help customers realistically plan the investment required for their project's execution and fulfillment
- **Forecasting:** Complete certainty in every aspect of a project is unattainable, meaning reasonable assumptions need to be made about the future based on current trends, economic conditions, and industry conditions. As with planning, injection molders are often tapped for predictive analysis and input on materials, feasibility, costs, and the like
- **Sourcing:** Injection molder supply chains often extend around the world, providing timely information about weather, geopolitical incidents, and other events that may impede timelines, resin availability, choices in alternate materials, and pricing

In addition to finding cost and production efficiencies on a project, injection molding supply chains often extend around the world. Having a pulse of what's going on globally that could impact timelines, resin availability, and the potential need for alternate materials

An injection molder with the experience to perform comprehensive testing, the insight to guide resin selection, and the capabilities to proactively support purchasing best practices adds value long before the first part comes off the production line.

For the better part of a century, Kaysun has been the recognized name in custom injection molding. Our experience, passion for the process, and dedication to our customers has earned us trusted partnerships with OEMs in a range of industries.

Request a Preliminary Part Design Review to experience Kaysun for yourself.





What's a Preliminary Part Design Review?

Set up your next injection molding project for success with help from Kaysun.

Led by Kaysun's expert engineering team, a Preliminary Part Design Review can help you make important decisions that impact your complex application, including:

- Design suggestions to improve part cost, tool cost or both
- Robust design development for consistent, long-term manufacturability
- Review of potential tool witness marks that may affect part function or cosmetics

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