



Optimizing Injection Molded Component Development

The design of an injection molded component, the subsequent design and construction of the mold(s) to manufacture the component, and the definition and ongoing execution of an efficient injection molding process all require significant levels of specific expertise. These three functions are all highly related and have to be executed seamlessly, in unison, to consistently assure component development success. Component developments that are not properly managed and coordinated can be extremely costly to an organization. These costs can include personnel costs for additional work, start-up delays, mold modifications, packaging line inefficiencies and/or missed product sales.

Packaging engineers are typically held *responsible* for delivering an injection molded package component development project. However, they are often at risk by not having control over the three functions normally completed by suppliers. This risk can be virtually eliminated through utilizing a well defined process and gaining the requisite knowledge to lead the development to successful implementation. While it could be an advantage to have internal expertise in all three areas, very few companies can cost justify the staffing to do so. It is not critical for packaging engineers to truly *master* any one of these three functions in their careers to be successful. However, it is critical for them to know how to manage the overall developmental process and consistently deliver successful programs on schedule.

The role of the packaging engineer should be to assure all the proper steps in a robust development process are completed and documented along the way, either internally or by the supplier. Understanding some basic part design and molding concepts and strictly staying in process can quickly prepare a packaging engineer to navigate their way through a program successfully. Junior engineers should be coached by management and experienced engineers to develop their skills and emphasize the importance of each step along the way. Understanding the concepts and adhering to the process will result in successful, timely mold start-ups.

The keys to successfully developing and implementing injection molded components are:

- Developing, implementing and strictly adhering to a process for injection molded part development, with well defined stage gate criteria that must be successfully completed and documented prior to progressing to the next phase

- Training your engineering staff on the basic fundamental concepts of part design, mold design and injection molding that will result in successful production, as they complete projects
- Partnering with competent suppliers who have experience in engineering and producing the type of part you want to manufacture
- Partnering with competent suppliers to perform the Material Flow/Cooling and Finite Element Analysis (FEA) analyses
- Partnering with mold builders who have experience in building molds for the type of part you require and sign a Mold Building Agreement that guarantees construction quality and mold performance
- Using mold and part qualification processes that will assure that components can be consistently manufactured using a process that runs “*in control and capable*” immediately upon mold start-up and through the life of the mold.

The primary value gained through implementing a robust injection molded component training program and development process within an organization is significant. You will have a high degree of confidence because:

- Components are being developed as efficiently as possible and will meet performance specifications
- Capital is not at risk for molds that might not perform well
- Expense spending is only on critical work
- Program timing will be achieved due to very low probability of problems during production start-up
- Resource planning for the future will be improved due to elimination of problems and achieving required time schedules
- Number of engineers qualified for component development programs will increase providing expanded options for staffing programs
- Job satisfaction for all involved will increase as a result of being successful

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