



Buyer's Guide

# 10 Tips for Analyzing PLASTIC INJECTION MOLDING QUOTES



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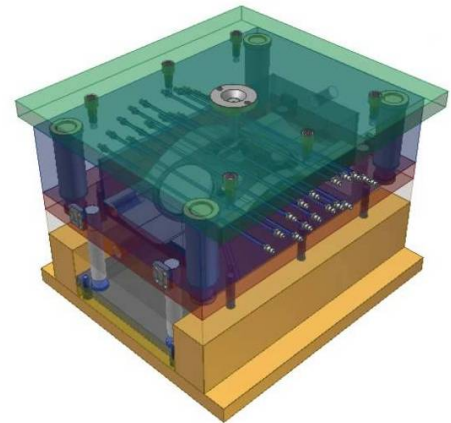
## INTRODUCTION

When receiving bids on a new plastic injection molding program, it is important to gather and analyze all the relevant data. This is true for both the building of molds and for the production of parts.

However, it can be challenging to compare quotes for slightly different items. There may be different classifications of molds, a different number of cavities in the molds, different pricing tiers, and many other variables to consider.

In an effort to calibrate things, it helps to put the specific information you want in a formal Request For Quote (RFQ) package that all the molders receive. Additionally, some buyers include a form or spreadsheet the suppliers are required to complete and submit with their proposals.

That being said, what are the key elements of an injection molding quote? Although there are many important items, in addition to the unique requirements of the project, of your company and of your own, this guide contains the top ten factors to consider when comparing plastic injection molding quotations.



### 1 MOLD QUALITY

Based on industry standards, injection molds can be classified anywhere from Class 105 (up to 500 cycles; good for prototyping) to Class 101 (extremely high volume up to one million or more). Besides workmanship, the distinctions between classes can include type and hardness of core and cavity steel, the type of injection and runner system, part ejection, slides and mechanical action, cooling, and other additional elements, like cycle counters and interchangeable inserts, if necessary. However, if extra features are included, try to figure out if those items really provide value or are just unnecessary bells and whistles thrown in to look impressive and to drive the price up. Also, will the molder perform and provide you with a Design for Manufacturability/ Moldability (DFM) study? A DFM study analyzes the design of an injection molded part with the intent of optimizing the quality of the part and the efficiency of the manufacturing/molding process and always should be done and reviewed with the customer when building a new mold.

## 2 GUARANTEE

If you are purchasing a valuable asset like a mold for plastic injection molding, it should come with some kind of guarantee. If it does, what all is covered by the guarantee? Mostly likely, the frame, cavities and cores are covered, but sometimes the mechanical action (e.g., slides, hydraulic unwinds) and hot runner systems are not. Additionally, what is the guarantee period - number of cycles, time, both? Also, is any kind of regular maintenance performed during the guarantee period, does the mold include any spare parts, who performs any necessary repairs, and is storage provided?

## 3 PRICE

While price, of course, is important, the bottom line is not necessarily the bottom line. You certainly want your molder's pricing to be competitive, but would you rather have just the cheapest price you can find, or high quality parts, great customer service, competent technical support, timely delivery, and a supplier you can count on to deliver all of that consistently? Will you get all of that from the cheapest shop on the block? If not, how much are those things worth to you? In other words, when analyzing competing proposals, be sure to compare the real value each molder provides, not just dollars and cents.



Also, generally speaking, there is an inverse relationship between the number of cavities in a mold and the individual part price. In other words, as the number of cavities in a mold goes up, part price goes down. Likewise, fewer cavities equals a higher part price. Essentially, the reason for this boils down to time. If four parts fall out of the mold every time it opens (because there are four cavities), it will take much less time to run production than if only one is made each cycle using a one cavity mold. However, the greater the number of cavities there are in a mold, the more expensive it becomes,

because it requires more labor and materials to build. So, you can pay more for a mold with more cavities and less for each part, or less for a smaller mold and more for parts. Decide your preference, find your sweet spot, and make sure you are comparing these related items accurately.

Lastly, will there be any additional charges you will be billed for later? See *Other Charges* below for a discussion on that topic.

## 4 LEAD TIMES

First of all, try to start your research for an injection molder well in advance of your need for parts. Typically, the process of building high quality injection molds will take at least three months, if there are no issues or changes, so be sure to plan accordingly. If you are to receive samples (which you should), at what stages in the building process will those samples be provided to you, and what are the estimated dates you will receive them? Additionally, what is the molder's stated policy regarding lead times for the manufacture and delivery of parts, once the tooling is production-ready? Lastly, do they provide for expedited production and, if so, what are those lead times and associated costs?

## 5 PART REQUIREMENTS

Ideally, your engineer or production department or part designer (or whomever) has supplied you with all the relevant information for you to prepare a complete and thorough request for quote (RFQ) package. We will discuss the contents of a good RFQ in a separate piece but, regarding part requirements, it should include the type of material, the color, surface finishes, any additives, and the allowable tolerances. Along those lines, note whether the quote specifically states the material family and grade to be used, or if it just gives the generic family or an alternate resin. Also, does it say that the color will be matched to the one requested? If a specific grade of material or color is not required for your parts, ask the supplier what they would suggest and what options there are.

## 6 QUALITY

Most sophisticated injection molders maintain a quality management system that has been certified by an independent, accredited certification body to be in accordance with ISO standards. The International Organization for Standardization (ISO) is an independent, non-governmental organization that is the world's largest developer of voluntary international standards. The ISO 9000 family deals with the fundamentals of quality management systems, and ISO 9001 sets out the requirements that organizations wishing to meet the standard must fulfill and is the only standard in the family to which a company can be certified. As of the time of this writing, the current version of this standard is ISO 9001:2015.



ISO also maintains certain technical standards that relate to specific industries, as do some trade organizations. In addition to ISO certification, some molders are registered with the federal government relating to their industry of focus.

Regarding quality assurance, be sure to inquire about the potential supplier's quality personnel and their qualifications, the company's inspection equipment, and their policies, processes and history. Additionally, how do they create a quality control plan? Will they work with you and your technical staff to customize a plan that fits the program's unique requirements? Do they conduct periodic reviews and audits of their systems to make sure everything is functioning properly? One benefit of working with a certified molder is that they are required to do these types of things, so it alleviates you having to check up on them yourself.

## 7 SECONDARY OPERATIONS

In addition to producing molds and manufacturing parts, many injection molders perform a variety of secondary operations for their customers. For instance, there are three basic types of plastic part decorations that are performed: Pad printing, hot stamping, and digital heat (thermal) transfers. Pad printing uses an offset printing process with a silicone pad, hot stamping is a dry printing process in which heated die and foil are used to apply graphics to a part, and utilizing digital heat transfers also is a dry printing process but the digital heat transfers are pre-printed digital images. In-mold decorating and screen printing are other possibilities. There are advantages and disadvantages to each method, so some research on each should be performed. Other secondary operations can include machining, hardware installation (e.g., ultrasonic welding), assembly, and packaging.



In addition to these secondary operations, there are other manufacturing methods that are performed by some injection molders. One example would be insert molding, which combines metal with plastic into a single unit, whereby plastic is molded around metal pieces like screws, magnets or fasteners into the part. Additionally, overmolding is a process that combines two or more different materials to make one part. Sometimes this entails molding plastic over another, smaller plastic part to make a single, larger unit. If your parts require one of these types of operations, be sure to inquire about it on the front end.

## 8 OTHER CHARGES

As the saying goes, “The devil is in the details.” Sometimes those details are listed in really tiny font, and other times they are not mentioned at all. So, you have to know what to look for, and what questions to ask. Some molders like to keep things simple and amortize all of their costs into the price of the mold and the price of the parts. However, many suppliers separate things and charge extra for them. The most common additional fees that molders charge for include shipping, tariffs and customs



fees, mold and process validation, mold setup fees, material change fees, color change fees, maintenance, and storage. While charging separately for some of these items might be reasonable (e.g., shipping costs may not be known until later), other times certain elements are omitted in order to make the price seem lower. One good example of this is when the mold and process validation are presented as fees independent from the fabrication of the mold. As validation of the mold really is part of the mold building process, it should be included when presenting and analyzing the cost of tooling.

## 9 TERMS & CONDITIONS

Not surprisingly, more devilish details are contained within most suppliers’ terms and conditions, as they are in nearly all legal documents. However, while it may seem tedious and overwhelming, reviewing them is worth the time and effort. Discussing the issues related to the terms and conditions of a manufacturing contract or supply agreement is outside the scope of this essay, but they should not be neglected, and you certainly can and should address any questions or concerns you may have about them with the supplier. If you do not feel comfortable handling this kind of analysis on your own, be sure to elicit the advice of a knowledgeable superior and/or outside counsel.

## 10 COMPANY

Finally, it is a good idea to take a step back mentally and think about the company as a whole. How does their facility look, messy and unorganized or clean and orderly? Does the office, shop floor, and warehouse appear to be calm and controlled, or are they disorganized and chaotic? Do they have an in-house tooling department, or do they have to send things to outside suppliers for work? Do they have new, modern machines and equipment, or do things look a little older and rundown? What type of processes do they have in place? How do they handle quality controls and inspections? Do they

have a formalized quality management system, and is it certified? What happens if there are defects in the parts you receive? What if deliveries are late?

In addition to infrastructure, policies and procedures (and probably just as important), what type of people are they? Are the personnel knowledgeable, pleasant and genuinely want to be helpful, or do they come across as rigid, difficult, uncaring and/or uncompromising? Does the company have any training programs? What about any employee engagement programs? If you can sense this, do the employees appear to be happy and enjoying their work, or are they grumpy or overly timid? If the latter, that may be the result of an unpleasant working environment or a poor company culture, which is something you will put yourself into indirectly, if you choose them as a supplier.

## CONCLUSION

Researching potential injection molding suppliers, providing candidates with requests for quote and your program's requirements, and then analyzing all their proposals can be a lengthy and tedious task. Nevertheless, understanding what to look for in a prospective molder and how to analyze their quotations should make the task a little easier, although it is prudent to invest the necessary time.

Remember that you are not just looking for a plastic injection molding supplier; you are researching, evaluating and, ultimately, choosing a manufacturing partner. So, be thorough, thoughtful and choose wisely. Your program's success and your peace of mind depend on it.




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