

Parting Shots

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New Product Development and Die Casting Process. Friend or Foe?

The design of any product is only limited by the imagination of the designer, the laws of physics and the capability and reliability of the process. This is an area where multi-discipline teams can bring greater and more rapid success to new product launches.

Die castings are particularly design-dependent as much of the tool design is dictated by the product design. To a large extent it can be said the product designer is designing the tooling. Parting lines dictate the location, thickness and overall size of tool steel. Quite often the location of gate (metal feed entries) are a result of the available parting line rather than a best choice based on design for quality.

Good practice would have the metal enter in the thickest area of the casting and flow toward the thinner areas last. Again, the opposite can be dictated by product design, for example if the only practical area to gate happens to be a thin area which feeds metal to the thickest area last. The result is shrinkage porosity. Porosity defects in this situation are not only undesirable, but also inevitable! Given the opportunity early in the design development, the designer and die casting supplier can often reach compromise that provides the necessary function and ultimately reduces cost.

On one such program, the designer and die casting supplier working together began from what many call the "gray box" design stage. "Gray box" designs, provide a basic function and performance requirement, but leave much of the form, wall section and process up to the final

designer. Beginning from that point, the casting design was developed with the tooling and gating design in mind. The result was a casting that included features not previously thought possible while achieving cost targets.

What then is a product designer to do?

I advise developing relationships with supplier companies that have the proven expertise to assist in value added engineering. They know where weakness would exist in the tooling designed in certain ways and also know of capabilities that the designer may not be aware of. Examples abound of innovations that came from collaborating with the supplier engineers.

Just because a company has been in business for a long time, is no guarantee they have trained experienced personnel. By the same token, young companies can have qualified personnel. How can you tell you have contacted a company capable of providing this service? Ask them for the following information.

- Do they have personnel who have dedicated 10 or more years in their specific discipline?
- Can they provide references?
- Can they provide examples related to your specific application?

What if you are the casting supplier wanting to provide this service?

- Let your customers know that you have the capability and willingness to help.
- Be committed to the long term. It takes time. Programs can take 12 to 24 months or longer from initial meeting to first samples.
- Introduce your customers to your technical team.

- Allow "matrix" type communication between departments and customers.
- Be knowledgeable of the current process capabilities of your machinery. (There's more to capability than just the locking tonnage of the machine when it was new.)

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