



## Product Development: DETERMINING MANUFACTURING REQUIREMENTS

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### THINK FUNCTION

Start your project with a blank slate; think about how you want your end product to perform. If your product does not work, nothing else matters.

### ANALYZE THE PRODUCT'S WORKING ENVIRONMENT

Understanding the environment that your product will be operating in will help you determine the materials and manufacturing requirement for your product. Among the things to consider are:

#### *Operating Temperatures*

The operating temperature plays a large role in determining the materials used and the process selected. Three criteria should be evaluated, including: cyclic versus steady state, continuous or transient, and internal versus external.

#### *Applied Loads*

Stress levels or deflections of applied loads must be assessed. Four types of loads should be evaluated, including:

1. Long term or continuous, which can cause creep or stress corrosion.
2. Short term, applied rarely
3. Cyclic, repeated thousands or millions of times.
4. Impact, applied a few times or even just once resulting in fracture or severe distortion.

#### *Environmental Needs*

Materials are subject to atmospheric and galvanic corrosion. In many instances, no additional precautions are needed to prevent corrosion. However, depending upon the application, corrosion protection might be needed.

#### *Electrical Requirements*

Conductivity and Electromagnetic interference (EMI), formerly radio frequency interference, are among the things to consider when choosing materials for your product.

#### *Mechanical Tolerances*

How closely do the physical measurements of your product need to be and how consistent do you want the material properties to be.

### ANALYZE THE PRODUCT'S OTHER REQUIREMENTS.

Other things to consider are:

1. Will there be assembly work on this product?
2. Is the cosmetic appearance of this product important?
3. Economics; will cost and price be a factor in the success of this product?

### DIE CASTING

When it meets your requirements, Die Casting can provide a low cost method to produce parts that boast longevity, intricacy, consistent quality, and moderate-to-high impact dent resistance. They can often replace several component pieces with one part, provide good electrical conductivity and heat transfer, and are easily machined when needed. Die Castings work well in a wide range of temperatures. A number of different finishes can be applied to the casting, from painting to plating and sand blasting to mirror polish. These can alter their appearance for cosmetic purposes as well as improve their resistance to the elements.

Before assessing what you want your product to look like, consider the points addressed in this article. The product's function, working environment, and other miscellaneous requirements should be thoughtfully considered prior to beginning the actual die casting process.

Aluminum die castings are also 100% recyclable to help with our environment.