3 keys to developing a successful DFM process

By Todd Owens
Vice President of Engineering for Donatelle

Donatelle
Manufacturing that changes lives®

3 keys to developing a successful DFM process

By Todd Owens
Vice President of Engineering for Donatelle

The manufacturing processes used to produce a new product are as important as the product characteristics that define and constrain it. Taking product development shortcuts up front to save cost or time on medical devices – deliberately or accidentally – often blows up on the back end with costly quality risks and manufacturing issues, and even product delays. Even a product with seemingly simple part geometry can be extremely challenging to manufacture.

That's because many factors – including the materials used, required tolerances, part geometry, process control limitations, and more – influence how effectively and efficiently a product can be produced.

To ensure the value, quality and reliability of a new product at scale, implementing a robust design for manufacturability (DFM) process is one of the most important elements in designing, developing and manufacturing. When done well, a DFM process aligns product requirements with the capabilities of the manufacturing processes.

Here are three keys to implementing a successful DFM program:

1. Build DFM into the program plan

When developing a project plan for a new product, timelines should build DFM in as a process, not an event, to determine the most appropriate processes, equipment and materials for the final product.

DFM should begin early in the product design process, and well in advance of tooling and production. Oftentimes, manufacturers delay the start of DFM until a product's design is nearly complete and internal discussion shifts to development of the manufacturing process. But this is too late. At this stage, manufacturers risk going down product development paths that drive up costs, create quality challenges and force rushed decisions leading to oversights.

Prototyping is an ideal time to start the DFM process. Lessons learned during prototyping can then be applied to product design and manufacturing process design, allowing manufacturers to vet potential downstream issues and capitalize on ideas that can improve product quality, as well as reduce production non-recurring and product part costs.

3 keys to developing a successful DFM process

By Todd Owens
Vice President of Engineering for Donatelle

2. Consider all the elements

A thorough DFM process addresses all elements of the manufacturing process including, but not limited to:

- tolerances/specifications
- product geometry
- packaging
- metrology/inspection
- inspection
- material
- shipping/transportation
- supplied components
- outsourced processes
- automation
- tooling/fixturing
- ergonomics

As such, the most effective DFM approach includes involvement and input from team members with expertise in these areas, e.g., product design, quality engineering, supplier quality, process, tooling, metrology, packaging, etc.

In addition, to help ensure smooth transitions from stage to stage and collaboration among team members, a mitigation plan should be developed to outline how to resolve design and manufacturing issues, such as if it is discovered through the DFM process that the design requirements for a component cannot be feasibly manufactured. While this plan may change as more information becomes available, having a base plan established can make navigating such situations much more efficient and effective.

3. Keep records

Through the DFM process, a record of each update, decision, revision and enhancement should be maintained to at once capture the knowledge and create a referenceable repository of considerations evaluated, changes made and the rationale behind them. This reference also will help as team members change and the product program evolves.

Moving forward

Executed correctly, DFM can significantly impact the cost effectiveness and predictability of the manufacturing process which, in turn, can reduce the risk of quality-related issues, and add credibility and robustness to the supply chain for years to come.

3 keys to developing a successful DFM process

By Todd Owens
Vice President of Engineering for Donatelle

About the author

Todd Owens is Vice President of Engineering for Donatelle, where he leads the design, development and validation of tooling and manufacturing processes for new products. During his 30+ years, Todd has held a variety of engineering, program management and leadership roles in the automotive and medical industries.

About Donatelle Plastics Inc.

At Donatelle, we make products that enhance – and save – lives. We manufacture complex medical devices and components for low- and high-volume needs. That's all we do. And we do it with the utmost precision, consistency, and rigor, because for you – and your customers – **quality is essential. Reliability is a must. And delivering on what's promised is vital.**

Learn more about how we can help bring your medical devices to market – with confidence.

Contact +1.651.633.4200
Visit donatellemedical.com

Donatelle
Manufacturing that changes lives®