



Industrial Molds Group

3D Printing Won't Displace Injection Molding/Molds Anytime Soon

3D printing, also known as Additive Manufacturing (AM), has captured the imagination of the manufacturing world. As greater progress is being made in the area of production parts, both in plastic and metal materials, people are asking if it will only be a matter of time before molds and the traditional method of molding plastic parts, will be obsolete.

The short answer is no. While there are a lot of opportunities for manufacturing production or end-use parts using 3D printing, the best way to manufacture production parts in large quantities quickly is with a steel or aluminum mold. Let's look at a few of the reasons.

With the Direct Metal Laser Sintering (DMLS) process from EOS GmbH, a German firm that was an early entry into 3D metal printing, some excellent advances have been made. SLM Solutions GmbH, arose as the challenges in 3D metal printing with its Selective Laser Melting (SLM) technology. Both of these technologies are seeing success in production parts for medical, dental, aerospace and some automotive.

GE Aviation has picked up the ball and run with it, being one of the largest OEMs to bring 3D metal printing onto the production floor, not only with its facility in Cincinnati (formerly Morris Technologies), but with the installation of a full-blown 3D production facility in Auburn, Alabama, where it will make fuel nozzle parts for the LEAP jet engine. These components were once fabricated through the subtractive method of machining. The additive method has given GE some competitive advantage.

While 3D printing of plastic parts began back in the late 1980s and early 1990s, these were primarily prototype parts that didn't have much use beyond the "touchy-feely" aspect of being able to hold a part in your hand and check it out. As materials evolved in the early 2000s, to achieve more actual plastic properties in a wider range of plastics such as ABS, the idea that companies can now "build" these plastic parts rather than mold them became attractive. Conversations about 3D printing plastic parts always include something like, "And you don't need to build a tool!" However, there are downsides of that, the first being the size of the build envelope was constrictive. That is being remedied to some extent and 3D printer companies are expanding the size of the build box so larger parts can be manufactured.

Secondly, it takes time to build parts using 3D printing. Sure, you can go from print to 3D part in a day or so, depending on the size and complexity of the geometry, but typically you're only building one or two parts at a time. If the parts are small, some 3D printers can build up to 18 parts. And, depending on the application, some of these parts may need secondary finishing. So even if you have eliminated the time and cost of the mold, you may not save a whole lot in the long run, depending on the part volume. For high-volume

production runs your best bet is still a multi-cavity mold.

3D metal printing has come a long way as well. But, it has basically the same limitations as printing plastic parts when it comes to the size of the build envelope and the fact that many of the parts need secondary finishing including CNC machining. Why can't we 3D print a mold and use it to mold parts? Well, it has been done. There have been a few companies that have built a 3D core and cavity, dropped it in a mold base and run some plastic parts, but there are limitations there as well.

Given the heats and pressures in injection molding, these "prototype" molds can make several hundred parts, if you're lucky. If you're using softer resins such as PP or LDPE, you might get a few thousand parts, which would be good for a trial run but not for a high-volume production run.

Using the Fused Deposition Modeling (FDM) technology, Stratasys has proven that they can print a core and cavity out of ABS plastic, and get a few dozen parts out of it before it loses its dimensional correctness. Good perhaps for prototype parts but not production.

As 3D printing technology advances, it is certain to become more prevalent in production environments. However, where precision plastic parts and high volumes are needed, injection molding will remain the most cost effective way to produce plastic parts.

At Industrial Molds, we've invested more than \$2 million dollars in our company to put us on the cutting edge of mold manufacturing technology. We can help you achieve your goals with any of your mold projects including pilot/prototype molds, low- or high-volume production molds, and your mold qualification and process validation procedures.

Contact us for your next project!
www.industrialmolds.com

***Industrial Molds Inc - The Value of
Precision***

**Sincerely,
Industrial Molds, Inc.**

