Introduction

The benefits of 3D printing are very good, but a new white paper reveals that once the mold is printed and post-processing begins, you may be paying for more than you bargained for.

Credit: http://www.newequipment.com/research-and-development/five-secret-costs-3d-post-processing

1. Lost Production Time:

Grimm's research indicates that every six hours of 3D printing costs one hour of post-processing. The sample size is six companies, but that still equates to 17 to 100% increase of total process time.

What this also means is that while your company is engaging in post-processing, the 3D printers aren't being run, creating a bottleneck and possibly impeding time to market.

"Newell Rubbermaid runs its 3D printers at 60% efficiency, because of the bottleneck of post-processing," Marangell says. "Imagine running your factory three days a week, imagine how uncompetitive Ford would be if it was only running their car factory for three days a week."

2. Increased Labor Cost

All that sanding and fine cutting with X-Acto knives takes more than just time; it takes people. And probably highly skilled, highly paid people, at that. The companies involved in the research reported a fully burdened labor rate cost of $30 to $100/hr. The staffing expense for running four to 10 printers is $100,000 to $500,000/ yr.

3. Shallow Labor Pool

The time it takes for post-processing also factors into how much innovation you can squeeze from your R&D team. If they are manually sanding and soaking prototypes, they aren't coming up with new ideas and creating new prototypes.

"If you remove post-processing, that whole team could be working on the next print," Marangell says.

And the hiring process for your 3D printing team is also hindered. One engineering manager surveyed notes, "Post-processing is kind of an art form." Some finer geometry requires a surgeon's touch, which an otherwise qualified design engineer may not have. So are you missing out on a conceptual superstar and settling for a serviceable jack-of-all-trades?

3D Printing
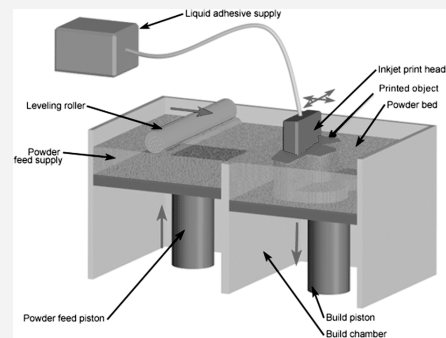
4. Unreliable Quality

The process of printing any 3D models is ridiculously advanced compared to the rather crude tools used to finish the models: X-Acto knives, sandpaper and spray nozzles. I had those tools in my high school freshman art class, a time so long ago Nirvana was still touring.

"No matter how good you are at cutting off those supports, you still leave a little amount," Marangell notes. "You change the geometric accuracy of the part. It's a nasty process."

And if the part is damaged or broken, you have to start the whole process over again, or make duplicates. This takes more labor, more printer time, and more materials.

5. Environmentally Hazardous

The medical device company canvassed by Grimm stated that their 3D printing operation was "the largest generator of hazardous waste in its entire R&D facility."

SLA models may be soaked in sodium hydroxide, a highly corrosive liquid. The dangers there should be readily apparent. And ABS and PLA materials have been found to be quite dangerous if inhaled.

"All of this stuff, if you don't have it in a separate room, you've got dust everywhere," Marangell says of certain SLS operations. "You could see it on the reception desk, it's so fine."

These costs add up in a hurry. You have to buy the materials and dispose of them properly, along with outfitting your workers in proper gloves, clothing and breathing apparatuses. You'll also need the space to safely operate and it has to be properly ventilated.