WHY 3D PRINTING CONSUMABLES PRODUCERS NEED TO GET INVOLVED IN PRINTING TECHNOLOGIES?

About the Author

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MM 2018 insightssuccess

"To sell the oil, give away the lamp!"

This Chinese proverb already made sense thousands of years ago, when a certain wick sucked up oil of a defined viscosity – and it certainly helped finding new customers for the seller's oil. This principle has always been utilized; think of the razor blade, game console sellers, mobile phone service providers –or 2D Printer producers offering the machine even at a loss, knowing the specially designed cartridge will more than compensate for the poor hardware deal by selling the modern oil: The ink.

Unfortunately today's giant chemists like BASF, Covestro, Evonik and the like believe in the "Open Platform Initiative" of the new sun in the 3D printing sky, Hewlett Packard. This is certainly a good deal for HP, as they already lost reputation during the years they couldn't deliver -after having announced their new technology way before. Realizing their patents and building the machine became a nightmare, thousands of unplanned man-years went into this endeavor; and the big players on the chemical side didn't really know how to access the market that was so young, undeveloped –and still doesn't show a clear path as to what technology will "win". So the chemists tested the waters with HP, and it looks as if both sides have found a winning position.

Why then "unfortunately"?
Because both sides will fail: If you dig into the annual reports, truth is that the printer sellers make their profit margin on the oil side–they need to sell consumables in order to finance R&D and machine production. On the other hand the chemists produce their oil, well adapted to the machinist's needs. Should the hardware partner face economical reality and be forced to achieve margin by taking the nice consumables business into his own hands, the chemist will realize how helpful he was –and how helpless he is now.

And there is even a third loser: The 3D printing r/evolution is retarded! The machinist only knows his kingdom, he creates machines. But 3D printing is about chemistry, the oil is king, for sure! So the chemist should invent the new technologies, as he defines the ingredients of tomorrow's magic substances, enabling incredible properties. Carbon3D is a good example here, his founder, Joseph Desimone, is a chemist, the well funded company received over 400mio$ and is a unicorn, showing a pre IPO value easily surpassing one billion $.

So chemistry it is! The next revolutionary printing step will be brought to life by a chemist's imagination.
This is why these big players need the courage to add a hardware leg and start tinkering with prototypes. They cannot wait for the machinist to tell them what material they need; neither for customers cozing their wishes. In the end product producers don't care about machines, technologies and chemistry, all they need is affordable material properties for production methods that need less post processing, like assembly. The time is in favor of intelligent more complex design, the chemistry can offer the properties, but the hardware is lacking speed, reliability and affordability. That is why 3D printing didn't climb up the industrial ladder and injection molding still isn't replaceable.

In consequence, hardware is the chemist's "must have", as it is the chemistry that defines the printing rules, the algorithms, and the speed. It all starts with the combination of molecules, and the hardware is the necessary evil the chemist needs to bring to a working prototype level; a TRL 5 (technology readiness level, 5=technology demonstrator) would already be sufficient, so the baton can be passed on to the professional machinist for optimization of the hardware side.

This is exactly what we do at Geniusthingks. With a bucket full of 3d Printing inventions we don't talk to printer producers, but to chemists at first. They give all the necessary input to determine material properties and speeds. We offer technologies from FDM filament heads mixing colors and materials, to huge daylight resin printers, gel pushing robots for prototypes surpassing 100m³ of print volume, house printing robots -and our specialty: drum printers that will replace these lame ducks of planar printers, ac/decelerating for every layer.

Printer design will see a paradigm shift in the coming years, when chemistry allows for faster layers than today's machines can offer mechanically due to their physical limits. Industrial production needs to come close to injection molding speeds plus assembly time, so layer-speeds of 100msec need to be achieved. This is more than a breakneck speed for the current producers; with HP offering 7.55sec/layer, claiming to be 10 times faster than the next fastest machine, their "industrial" future doesn't look too bright.

Geniusthingks however has filed several patents potentially surpassing this requirement and is looking for partners to realize the prototypes.