From the President
May / June 2009

My History with Stereolithography

As a guy who started out as a draftsman at General Electric drawing on paper with a pencil and a T-square, 3D CAD was revolutionary. When I saw the first part made from a stereolithography machine it was truly a miracle.

I was a young designer operating Unigraphics v.5 when I saw my first stereolithography apparatus (SLA®). Back in the early 1990's, General Electric Aircraft Engines had just purchased their first SLA-250. For me, it was love at first site. For the first time we were able to "grow" a physical part directly from our computer data – in just a few days! I will never forget watching my first SL part building. I was totally amazed to see the laser light tracing around the liquid photopolymer. As the build progressed you could see what looked like a distorted part down in the vat of the amber liquid. When the build was complete the laser stopped and the platform with parts attached to it rose up and out of the machine. There it was, a part that had existed only inside my computer just a day ago glistening under the florescent lights of the RP lab - and not distorted at all. From that moment on I was hooked.

It didn't take long for GE to build up their SLA department by adding other machines and staff and it proved to be an invaluable experience for me. I was the customer purchasing parts from the "internal" service bureau. Later in my career it helped me understand what was truly important to customers – excellent service and quality parts. Later, my passion for stereolithography and rapid prototyping led me to a new and exciting career and eventually laid the foundation for one of the "top five" service bureaus in the US.

The early SL parts were brittle and the accuracies were less than desirable. However, the machines worked and as the 1990's progressed, the new technology invented by Chuck Hull just ten years earlier was now commercialized. Building SL parts was starting to become a standard practice by engineers and designers in all industries. 3D Systems, Inc was born and the stereolithography technology flourished. OEM's acquired machines for internal projects and service companies started springing up to provide SL parts to companies that chose not to invest in the expensive equipment. Over the next decade, stereolithography dominated and became synonymous with the term "rapid prototyping".

Today, SLA is just one of many layer additive methods to quickly produce parts direct from 3D CAD. Other technologies such as selective laser sintering (SLS®), fused deposition modeling (FDM™) and 3D printing (3DP) have all made great advancements. Even high-speed CNC has made claims to be as fast as some additive processes. The term "rapid prototyping" has now been replaced with other terms such as "additive fabrication" because these machines no longer build just prototype parts. They are now

capable of producing production, or near production quality parts for functional applications and real time application testing.

Stereolithography may not be number one on all aspects when but when examined in total; it is the best, well rounded, affordable technology available. SLA has excellent speed and throughput, a wide variety of material choices, reliability, consistent accuracy and it provides a solution for complex parts built quickly and accurately with a wide variety of post finishing options. Additionally, SLA machines are true manufacturing centers that can run 24 x 7 and build consistent parts day after day. The speed and throughput of an SLA-5000, SLA-7000 and now the iPro machines are impressive enough to allow a service company like APP to provide thousands of high-quality parts with an array of near production materials and finishes at break-neck delivery schedules.

SLA has made leaps and bounds since 1990. The days of brittle, inaccurate parts have now been replaced with accuracies of +/-.007 inch over a 30 inch part in an array of materials. Additionally, newer machines provide a higher quality surface finish and easier support removal right out of the machine which cuts down on post processing and augments deliveries. Stereolithography was our vanguard technology and it continues to be the number one selling service. When you do something for a long time you become good. When you do something for a very long time you become great. SLA from APP is great; some say the best in the industry. On pages 9-11 of this month's newsletter we are proud to showcase several projects that SLA made a success – read on and enjoy this May/June issue that boasts SLA at APP.

In closing I would like to extend a personal thank you and happy birthday to Chuck Hull. As mentioned earlier Chuck is the inventor of stereolithography and is still working and inventing at 3D Systems. Back in mid-May while attending the RAPID 2009 conference I was lucky enough to be sitting with Chuck as he was handed a birthday cake for his 70th birthday. Happy birthday Chuck! – and thanks for the career.

Jason L. Dickman