DASSAULT SYSTEMES

SOLIDWORKS

3D PLATFORM

SPINNING OFF LEADING 3D PRINTING COMPANY WITH SOLIDWORKS

Using SOLIDWORKS design and analysis software, and PDM solutions, 3D Platform quickly developed and introduced the first large-format 3D printer in the 3D printing industry.

3DP
3D PLATFORM

Challenge:
Quickly develop a commercial-grade, large-format 3D printer to capitalize on market opportunity.

Solution:
Implement SOLIDWORKS Standard, SOLIDWORKS Professional, SOLIDWORKS Premium design and analysis, SOLIDWORKS Electrical 3D design, SOLIDWORKS Electrical Schematics design, and SOLIDWORKS PDM Professional software solutions.

Results:
- Cut design cycles by more than 80 percent
- Introduced first large-format 3D printer
- Expanded access to engineering talent
- Improved 3D printer performance

Jonathan Schroeder was the engineering manager at a world-leading mechatronics linear motion manufacturer, where Joe Binka also worked as the lead new product development engineer, when the sequence of events in 2013 that led to the introduction of the industry's first large-format 3D printer began. Schroeder and Binka had worked on a new, compact linear actuator, which was designed to support x-y-z-coordinate motion, a natural fit for 3D printer motion.

The two men were discussing creating a gimmicky mechanism to take to a trade show—like the pick 'n' play chess set they had previously developed—when Binka said, "You know, if we had a 3D printer, we could design this kind of stuff faster." To which Schroeder replied, "Let's make a large 3D printer, using the new actuator, and take it to the trade show to showcase the actuator."

The quickly designed 3D printer that they took to that trade show in the spring of 2013 was the precursor to the 3D Platform 3D printers that are available today. That's because there was more interest at the trade show in the rapidly assembled 3D printer than in the actuator. Since the linear motion manufacturer counts many, if not all, of the leading 3D printer manufacturers as its customers, management decided to spin 3D Platform off as a separate company to avoid competition with customers.

Today, Schroeder is president of 3D Platform and Binka works at the company as an additive manufacturing engineer. Although SOLIDWORKS® design software was used to develop the first 3D Platform prototype at the linear motion manufacturer, as a separate, autonomous company, 3D Platform could choose any design solution that it wanted when the company began operations in 2014. "We briefly looked at other software packages but quickly decided to stay with SOLIDWORKS," Schroeder recalls. "A lot of our customers use SOLIDWORKS, and we believed that it would provide us with the speed and flexibility that we needed to capitalize on the large- and extra-large-format opportunity that we saw in the 3D printing market."

3D Platform chose the SOLIDWORKS 3D product development platform—implementing SOLIDWORKS Standard design, SOLIDWORKS Professional design, SOLIDWORKS Premium design and analysis, SOLIDWORKS Electrical 3D design, SOLIDWORKS Electrical Schematics design, and SOLIDWORKS PDM Professional product data management (PDM) software—because it is easy to use; includes capabilities for automating 3D printer configurations; and provides access to a broad, trained talent pool.

TOP-DOWN DESIGN FLEXIBILITY AND SPEED

In developing its line of 3D printers, 3D Platform employed top-down assembly, in-context, parametric design techniques, which provided the 3D printer manufacturer with greater development flexibility and speed. Instead of beginning each new product from scratch, the company's engineers can use SOLIDWORKS to quickly adapt existing designs. "Because all assembly design is top-down and in-context, we know where the mates and anchor points are," Binka explains. "This method allows us to start with a driver, such as print volume, to more quickly adapt designs.

"Using this approach in SOLIDWORKS, we moved from concept to prototype in about 70 days, which is one-sixth the time it would have taken with a more traditional approach," Binka continues. "This capability allows us to take our original one by one-meter machine, the first large-format 3D printer brought to market, and rapidly take it up to a four by eight-foot printer, and so on."

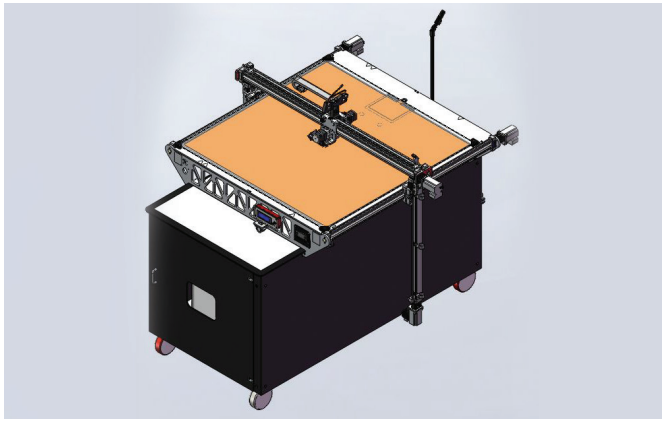
"With SOLIDWORKS Premium, we can do quick deflection checks as we develop different-sized printers, so we maintain the high performance level for which we are known as we develop new products."

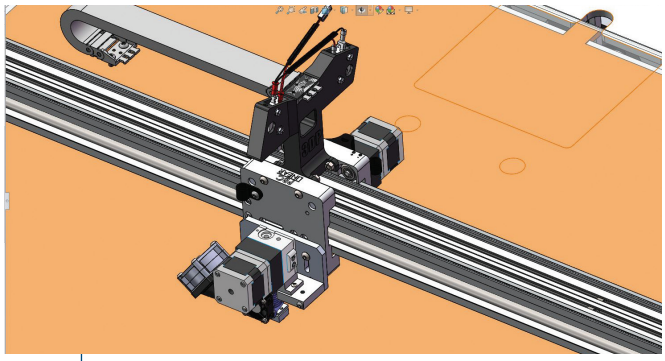
— Jonathan Schroeder, President

3D PRINTER AS LONG AS FOOTBALL FIELD

3D Platform also utilizes the simulation capabilities of SOLIDWORKS Premium software to improve 3D printer performance. Not only do 3D Platform 3D printers have the largest build area—including a 16 by 300-foot printer that's as long as a football field—they also print at a higher rate of speed, delivering faster return on investment. While conventional 3D machines' material consumption rates top out at about two kilograms of material a day, the 3D Platform's largest spool-fed extruder can consume more than 1 kg per hour and their pellet-fed extruders can consume more than 50 kg per hour.

"The core part of our intellectual property [IP] is our extruders, which allow us to produce larger parts faster," Schroeder stresses. "With SOLIDWORKS Premium, we can do quick deflection checks as we develop different-sized printers, so we maintain the high performance level for which we are known as we develop new products."





3D Platform utilizes top-down assembly and in-context parametric design techniques in SOLIDWORKS to save time during the development of 3D printers of varying sizes, including a 16 x 300-foot printer that's as long as a football field.

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EASY TO COMMUNICATE AND FIND TALENT

With SOLIDWORKS, 3D Platform can communicate more effectively internally and externally, as well as more easily attract skilled, trained design and engineering talent. "My preferred method of contact with customers and our engineering team is using SOLIDWORKS eDrawings® on my Microsoft® Surface® Pro 3 tablet," Schoeder points out. "eDrawings is great for adding notes and sending them back to our engineers, and I like the fact that when I send them to customers or vendors, I'm not giving away any IP."

"Thanks to the large number of trained SOLIDWORKS users and the SOLIDWORKS certification program, it's easy to find new people and immediately know their skill level," Binka adds. "More designers and engineers are certified in SOLIDWORKS than other CAD programs, which makes it easy when we need to add talent."

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