

# Harvard Apparatus, Inc.

INNOVATING BIORESEARCH EQUIPMENT DESIGN WITH SOLIDWORKS



Harvard Apparatus standardized on SolidWorks design software because it helps the company's engineers to reduce design cycle time, while increasing accuracy.

## CHALLENGE:

Accelerate the development of laboratory bioresearch equipment to maintain and extend its market leadership position.

## SOLUTION:

Adopt the SolidWorks 3D design system as its standard product development platform.

## RESULTS:

- Reduced design cycle time by 40 percent
- Increased accuracy of flow delivery by 50 percent
- Began product marketing earlier via photorealistic renderings
- Improved effectiveness of design communications

Harvard Apparatus, Inc., has been manufacturing the lab equipment that drives bioresearch since Dr. William T. Porter of Harvard Medical School founded the company in 1901. From inventing and commercializing the first mechanical syringe pump in the 1950s and the first microprocessor-controlled syringe pump in the 1980s to manufacturing the most advanced, easiest-to-use programmable syringe pumps today, Harvard Apparatus has produced a string of innovative bioresearch breakthroughs.

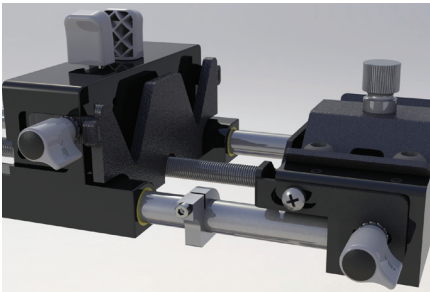
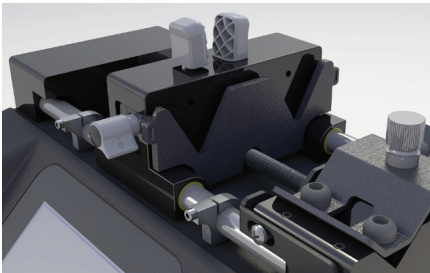
A Harvard Bioscience Company, Harvard Apparatus had used Autodesk Inventor® CAD software for product development until the acquisition of another company exposed the company's engineers to the SolidWorks® 3D design system. In an effort to determine which of the two CAD systems would help the company maintain and extend its market leadership position, Harvard Apparatus engineers used both applications for a while, according to Engineering Manager Mark Davis.

"As we gained experience using both packages, it became clear that SolidWorks software provided us with greater productivity benefits," Davis recalls. "SolidWorks is easier to use, has integrated analysis capabilities, and is better for sheet-metal and plastic part design. We realized that – with its additional functionality and file transfer capabilities – we should move all of our work to SolidWorks and make it our standard design platform."

Harvard Apparatus standardized on SolidWorks software because it is easier to use and provides a wider range of design capabilities, including integrated SolidWorks SimulationXpress analysis tools and the SolidWorks eDrawings® design communications application. "It's just so much easier to achieve what you want to do with SolidWorks because of its built-in intuition," notes Andrew McKenna, mechanical designer. "It's almost as if the software predicts your next move, which helps to advance the state of the design."

*“SolidWorks makes the conceptual design decision-making process so much faster, enabling us to produce a more innovative design in a shorter amount of time.”*

**Justin Piccirillo,  
Senior Mechanical Design Engineer**



By helping to shorten design cycles, improve quality, and boost innovation, SolidWorks software enables Harvard Apparatus to maintain and extend its market leadership position.

## Faster conceptual design

Since standardizing on SolidWorks software for all mechanical product design, Harvard Apparatus has shortened its design cycles by 40 percent and has accelerated product time-to-market. That was the case with its latest programmable syringe pump: the PHD ULTRA™, which is the company's flagship product and the top-performing computerized syringe pump on the market.

With the ability to control plastic, glass, and stainless-steel syringes ranging in capacity from 0.5 microliters to 140 milliliters, the PHD ULTRA increases the accuracy of flow delivery by 50 percent. The pump can dispense the contents in a six-inch long syringe in under a minute or over a week, providing greater flexibility for applications that range from drug infusion to electrical spinning operations.

“With SolidWorks, we were able to push the design aesthetics on the PHD ULTRA to come up with a more futuristic-looking industrial design, including interesting radii, blends, and curvature,” explains Justin Piccirillo, senior mechanical design engineer. “SolidWorks makes the conceptual design decision-making process so much faster, enabling us to produce a more innovative design in a shorter amount of time.”

## Powerful sheet-metal and plastics capabilities

On the development of its new high-precision syringe pump, Harvard Apparatus made extensive use of SolidWorks sheet-metal and mold development tools to create fabricated sheet-metal and injection-molded plastic parts. “We produce parts using a variety of materials and processes,” Davis points out. “Our sheet-metal designs are quite complex, and SolidWorks enables us to comprehend this complexity and make more accurate estimates and decisions, which results in a product free of errors.

“While we do not do any molding in-house, we do rely on SolidWorks mold development capabilities – including draft and wall-thickness analysis – to make sure our parts will mold correctly, which saves time working with our mold vendor,” adds Davis.

## Improved design communications save time

In addition to reducing design cycles, Harvard Apparatus uses SolidWorks communications capabilities to present designs to senior management, review designs with partners, and seed the market with photorealistic product renderings. The company uses SolidWorks files to print part and assembly models on its Dimension® 3D printer, SolidWorks eDrawings files to communicate designs with vendors and OEM partners, and the SolidWorks PhotoView 360 application to create renderings for internal review and advance product marketing.

“The ability to create accurate, photorealistic 3D images and eDrawings of our designs makes it far easier to communicate important aspects of the product, collect critical feedback, and begin marketing the new design before entering production,” Davis stresses. “Using SolidWorks PhotoView 360, we created images for marketing literature in advance of availability, which sparked and stoked demand ahead of the product launch.”



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