



Mike Riley

# HYDROFORMING OUTSIDE THE BOX

**SCOTT PRYER OF PRYER TECHNOLOGY GROUP EXPLAINS HOW FABRICATORS, IN THEIR PURSUIT OF FLEXIBILITY AND COMPETITIVE ADVANTAGE THROUGH NEW SHEET METAL FORMING TECHNOLOGIES, ARE DISCOVERING HOW TO LOOK TO THE PAST TO REALIZE THE FUTURE.**

At the IMTS event a few weeks ago in Chicago, I had the opportunity to visit with Scott Pryer and Cecil Sterne of Pryer Technology Group (PTG; Tulsa, OK) and run a few parts on their portable Triform Press, a compact and versatile sheet hydroformer that uses advanced containment techniques for the hydroform process. The press is extremely easy to run. Its process variables are precisely controlled through CNC programming that has complete diagnostic and recipe handling capabilities.

Even more impressive is the reduced weight and height of the press, which weighs one-third of traditional systems and installs above the floor with minimal setup. No need for any of the special flooring, expensive pits or foundations that we've all seen in shops in years gone by. This is definitely not your grandfather's hydroforming system, and its precision, size, mobility, and easy operation place an exclamation point on how technology could radically change the sheet metal forming business of the near future.

For example, think outside the box for a moment on hydroforming applications in the medical industry. Just as a doctor's office at the turn of the twentieth century now seems completely unfamiliar to us in the 21st century, the physician's office of the future could be very different from today. The vast array of high-tech equipment that Dr. Tomorrow will use could include a future portable hydroforming press that could



*The Triform sheet hydroform press weighs one-third of traditional systems, installs above the floor with minimal setup, and can be moved from one work cell to another.*

make custom precision parts on demand per outpatient application, right there in the examining room beside his office.

Think about how that hydroforming application model might expand into use in future automobile dealerships, garages, dentist offices, airports, and so on. How about military applications, where future portable hydroforming presses might be installed inside future C-5 and C-17 aircraft to make parts as needed and delivered in support of ground troops. All of this sort of change could eventually create entirely new markets with huge business opportunities for hydroforming press OEMs, along with enormous niche markets for shops that have hydroforming capabilities. A bright future indeed.

To place all of this future opportunity inside a practical perspective, I asked Pryer, the president of PTG, to share his insights on current hydroforming technology and the new opportunities it offers fabricators that want to gain a competitive advantage.

"As a fellow manufacturer, if we take anything away from the last two years, it is the defined need to be flexible, support ongoing reductions in costs, and pursue new technologies that allow us to gain a competitive advantage. When it comes to forming sheet metal, we can look to the past to realize the future," explains Pryer.

"Deep draw hydroforming was developed during the late 1940s and was the answer for a low-cost process of producing deep drawn parts. It is a specialized type of forming that uses high pressure hydraulic fluid in a flexible diaphragm to shape sheet metal against a single tool. Most metals from soft aluminum to high strength stainless steels are suitable for hydroforming. The advantages of hydroforming from the 1940s,

*Many manufacturers incorrectly associate hydroforming as a 'black art' that is too costly to utilize or too difficult to master. But advanced sheet hydroforming systems use the latest engineering tools, updated and standardized hydraulic components, and tie it all together with a powerful control platform to simplify sheet hydroforming.*





Tooling materials can range from two-part epoxy, aluminum, steel and even SLA/FDM printed materials. Single tool technology allows rapid development, inexpensive modifications and reduced maintenance costs. In addition to reduced material thinning, the higher forming pressures significantly reduce spring back and produce near net shape parts.

1950s and 1960s are once again a primary driver for progressive manufacturers that want to succeed in the post-recession period. These advantages include low-cost tooling, reduced tooling lead time, better control for material thinning, no need for mating dies, reduced die marks on parts and quick setups," he says.

"Tooling materials can range from two-part epoxy, aluminum, steel and even SLA/

FDM printed materials. The use of single tool technology allows for rapid development, inexpensive modifications and reduced maintenance costs. In addition to reduced material thinning, the higher forming pressures significantly reduce spring back and produce near net shape parts.

"While some manufacturers are familiar with hydroforming, many incorrectly associate it with a 'black art' process that is either too costly to utilize or too difficult to master. Addressing both of these misnomers is the advent of the Triform line of sheet hydroforming systems. Using the latest engineering tools, updated and standardized hydraulic components and tying it all together with a powerful control platform, these hydroform systems simplify sheet hydroforming," notes Pryer.

"The use of advanced engineering allowed for the design of a unique pressure containment system that significantly reduced the press size without sacrificing integrity or durability. The presses do not typically require special flooring or ceiling height requirements, which eliminates the need for expensive pits and foundations. The smaller press systems are even considered portable and can be easily moved from work cell to work cell.



Modern control platforms give operators complete control throughout the forming cycle. Each forming cycle can be programmed to use up to 30 pressure values and punch positions necessary to overcome excessive material thinning, wrinkling and tearing, while maintaining difficult tolerances. In many cases, the number of forming operations can reduce from two or more down to just one.

"The modernized control platform gives the operator complete control throughout the forming cycle. Each forming cycle can be programmed to use up to 30 pressure values and punch positions. This ability will equip operators with the precision control necessary to overcome excessive material thinning, wrinkling and tearing, while maintaining difficult tolerances. In many cases, the number of forming operations can be reduced from two or more down to just one. A key benefit to the closed loop control is the repeatability from part to part, run to run and from press to press," he continues.

"Modern hydroform systems are available in sizes ranging from 12 in diameter to 42 in diameter and standard tray format systems up to 98 in long. Standard pressure configurations range from 5,000 psi to 15,000 psi, and entry level systems start at less than \$250k. Neither the benefits nor the technology behind hydroforming are new. However, the modernization of this technology has generated new capabilities for manufacturers that may have considered hydroforming to be outside their reach," concludes Pryer.

The bottom line is this: When it comes to technology, quality, and price, advances in hydroforming now offer fabricators new ways to penetrate markets they may have considered outside the box before. ■

Mike Riley is the editor of Fabricating & Metalworking magazine and the author of *Backfield In Motion* (Derek Press, 2007). Share your views with him on how you view the future of sheet metal forming technology at 205-681-3393 or mike.riley@fandmmag.com.

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