

## **Value-added Engineering is a Specialty Effort**

Carolyn Mathas

Value-added engineering simply means just that. It enhances and customizes a standard solution so that it works better; offers cost, reliability and performance benefits; or uniquely solves a long-standing challenge.

Providing value-added engineering is more than lip service and empty claims. It requires that an engineering team be in place, tasked with improving project quality and employing a high level of skill, communication and collaboration that adds value at every step along the way.

Specialty Manufacturing takes standard, off-the-shelf valves and components and adds application-specific value to designs for its customers. The ability to listen, evaluate, customize, test and deliver solutions — ranging from a minor tweak to a major redesign — defines Specialty Manufacturing and its missions. Here are four examples that illustrate the types of challenges it routinely solves.

### ***Fuel Line Backflow***

When a major industrial equipment manufacturer experienced fuel line backflow problems on fuel lines used in fork lift tractors, a variety of standard valves were considered. Possible solutions ranged from ball check valve prototypes to a simple brass check valve, with modifications for cost and function. After collaborating with Specialty Manufacturing, the solution, created over the span of three months, modified a standard design for a precise fit for the specific application footprint. It involved the addition of a spring that regulated valve activation, custom barbed inlet and outlet ends and nickel plating, resulting in effective operation.



**Figure 1. Specialty Manufacturing check valve solves fuel-line backflow challenges in a forklift tractor.**

In this case, the customization provided a reduction in long-term costs for the successful product, as well as a reduction in warranty repairs.

### ***Engineering for Reliable Diesel Exhaust***

Reducing the size of one valve often begins a chain reaction of finding additional smaller valves to complete a system. This was the case for a global diesel equipment manufacturer. When implementing a smaller footprint for a valve on a diesel exhaust system, they needed a valve that could fit into a smaller manifold.

Specialty Manufacturing worked closely to deliver a preset and tamper-proof cartridge-style regulator that could be threaded into a manifold. While a standard design and common internal components such as spool spring and seal remain, the modification centered on customized external elements including ends, threading and materials.

The modifications, while slight, are effective. Not only did Specialty meet size requirements, the relatively low-cost valve solution increased reliability.

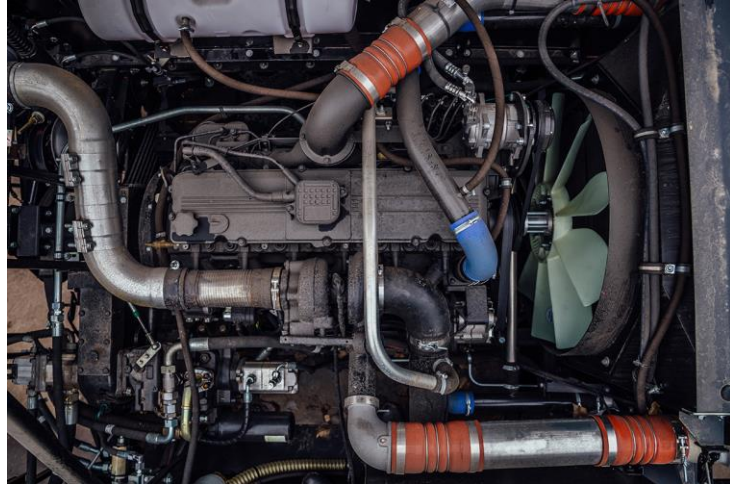


Figure 2. Specialty Manufacturing delivered a customized check valve solution that met miniaturization requirements and contained costs.

### ***Hog Watering Valve Eliminates Flow and Leakage Woes***

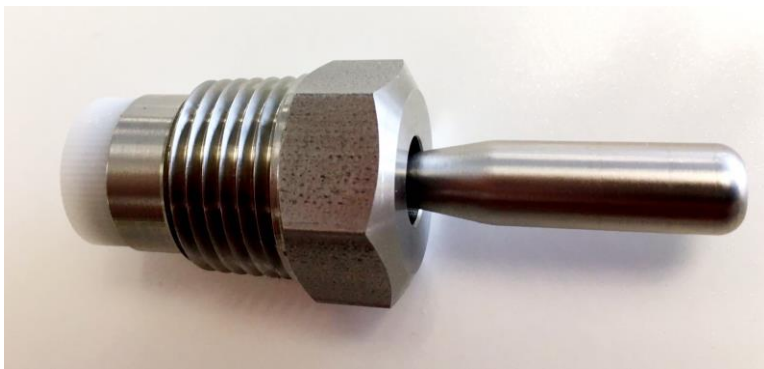


Figure 3. A custom toggle-valve design resulting in 30 percent water consumption reduction at production facilities, as well as 18-22 percent drop across the entire system. Source: Specialty Manufacturing

One of the largest family-owned pork producers in the United States needed to improve the flow of water and subsequently find a valve design that could efficiently and effectively deliver water to their hogs. Addressing an inconsistent water flow through the valve was the first step to improve the valves performance. To improve water flow Specialty engineers recommended a redesign of an internal plastic nozzle that

could be used with the existing valve. Prototypes were developed and tested successfully. The result was more consistent and predictable water flow.

The second phase, implemented after the use of the new nozzle design for a year, involved improving the overall valve design's manufacturing inconsistencies and early valve wear and

tear. Specialty Manufacturing would need to engineer a solution that could eliminate leaks, last seven to 10 years and work with the existing water distribution system as well as a new, planned water system. The Specialty solution involved changes to threading, internal springs and a new toggle design. While major design customization was required, Specialty took only eight weeks, accessing its in-house engineering, machining, prototype and testing capabilities.

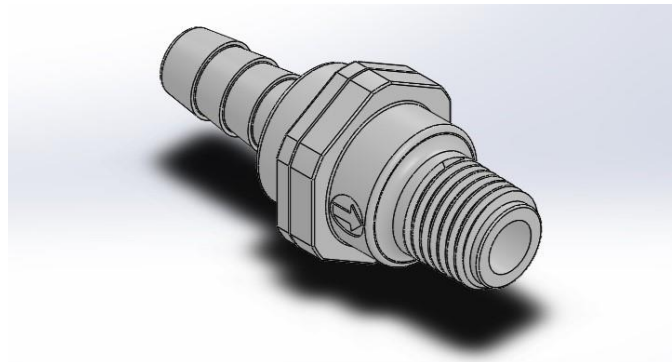
With an operation that spanned 44 farms and four Midwest states, the stakes were high. Specialty engineers reengineered the valve to eliminate design flaws and optimize water flow. Once implemented, the customization yielded an annual savings of millions of gallons of water and thousands of dollars in manure transfer costs.

### ***Delivering a Unique Hydraulics Valve Configuration***

Often, value-added engineering is based on much more than a simple design change. For example, when a hydraulics-system company required a compact check valve for a new application that delivered glycol and water at ambient temperature with a 0.25 crack pressure, the demanding requirements would have caused most valve manufacturers to simply pass on the opportunity.

While Specialty Manufacturing's 406 series compact check valve met the customer's footprint specification, it also needed a 0.25 inch male NPT (4M) outlet that could meet configuration requirements.

The resulting solution, based on substantial collaboration between Specialty and the customer, not only met performance and space requirements, but also used a poppet functionality that improved sealing properties. The long-standing customer was confident enough in Specialty's dedication and commitment that it chose not to look at competitive options. The collaboration resulted in the creation of new injection mold tooling and prototypes plus additional testing. The customer experienced improved reliability and performance advantages with the value-added design.



**Figure 4. Specialty Manufacturing's 406 plastic check valve was modified with customized end and cracking pressure to meet application requirements. Source: Specialty Manufacturing**

### ***Adding Value Long Term***

It's not surprising that Specialty Manufacturing sees a lot of repeat business from its client base over the long haul, in addition to attracting new customers. The value-added engineering skills and services yield unmistakable results, including greater overall efficiency and cohesive project collaboration and management for each and every project. Discover how the Specialty Manufacturing Co. can collaborate with you to solve the valve performance challenges in your application. To get started, visit <https://www.specialtymfg.com/configurator/>.