



Industrial & Aerospace Portfolio

Custom Research and Development Fabrication: Mufflers

About Us

HPS was founded in 1985 and has grown from a small enterprise to a leading industry supplier outfitted with a permanent Class 100 / Class 1000 Clean Room Certification. Services offered include custom fabrication, polishing services, detailed 3D CAD drawings, and analytical testing. Join our roster of customers that include NASA, Lockheed Martin, MedImmune, and others - experience HPS.

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The Challenge

At any given time, High Purity Systems has several irons in the fire; a few of these irons fall underneath the banner of research and development (R&D). Within that category, there are two different ways in which we can help our customers.

The first is a situation in which the customer has a problem but doesn't know the theoretical solution or how to build it practically — like our work on this [digester wiper](#). The second scenario is one where the customer already has a design to fix their problem, but needs someone to build a custom piece to see if it will function properly — such as our work on these [purge suitcases](#).

For one recent R&D project, a customer asked HPS for help building a muffler with strict precision requirements; it needed to be made from 316L stainless steel, weigh less than 2 lbs., and fit inside a pre-determined space approximately 12-14" tall by 3" wide.

The Strategy

Because of the heavy weight of stainless steel, it was suggested that we begin with a lighter 0.020" wall tubing. The thinness of this tubing made the bending difficult as the material tends to kink and flatten. Our fabrication team instead proposed an alternative solution that would allow us to bend it without any of these issues.

The resulting muffler was a canister type with three tubes stemming from the top; the center tube came with a flare-type connection while the other two were 90° elbows welded parallel to one another. The customer was so impressed with our team's speed and attention to detail that they recommended us to some of their colleagues, which led to more custom muffler prototypes being manufactured.

One of the other mufflers consisted of three canisters parallel to one another, welded together with 180° elbows. Another had a larger center canister with a long, straight tube on top and, next to that, a long 90° elbow that needed a flexible end on it.





Additionally, one customer wished to install what could only be described as small-bore flex duct. Our team quickly determined, however, that not only was this ducting too heavy to be feasible, but it would also be nearly impossible to weld because of the spiral casing. Instead, we suggested using a much lighter thin-wall vacuum bellows, giving our customer the final functionality they desired and leaving them eager to have HPS fabricate more mufflers for them in the future.

The Result

This array of custom mufflers is just one example of the kinds of fabrication challenges we have helped customers overcome during the R&D process. When designing one-of-a-kind prototypes, it's crucial to work with a fabricator that has a wealth of experience in bringing the end user's design to life and then efficiently mass producing.

If you have a vision, but don't quite know how to bring it to fruition; [let HPS help you.](#)

