



## Aerospace Portfolio

# Welding of Aluminum Coolant Flanges

### About Us

Since 1985, High Purity Systems has provided precision welding, quality piping installation and fabrication solutions to the industrial sector. High Purity Systems delivers value and responsiveness to meet the ever-changing needs of our clients. Expertise includes Class 100 Clean Room orbital welding, onsite piping installations from stainless steel to carbon steel, piping fabrication shipped nationally and custom prototyping.

### Contact Us

8432 Quarry Road  
Manassas, VA 20110  
[www.HighPurity.com](http://www.HighPurity.com)  
[info@HighPurity.com](mailto:info@HighPurity.com)  
(703) 330-5094



### The Challenge

Recently, a leading designer and manufacturer for the military and aerospace industries approached HPS to request our fabrication expertise in helping weld their aluminum cooling flanges.

Our client, a globally recognized pioneer in laser technology and electro-optical sensors, had state-of-the-art laser and electro-optical systems that required large amounts of cooling. They provided us with a custom machined 6061 aluminum cooling flange with 37° aluminum VCR flare fittings, and asked us to weld them together.

### The Strategy

With over 30 years specializing in specialty welding, HPS knew the best way to tackle the job. Referring to a customer-supplied drawing, HPS used precipitation hardened alloy 6061 aluminum and ER5356 filler to weld the fitting to the client's exact specifications and all associated standards.

When welding aluminum, helium leak testing can be an arduous challenge. If not done correctly, aluminum's porous nature can lead to warpage and damage the fittings. To combat these risks, HPS performed in-process tests and QA/QC inspections throughout the procedure including: a helium leak check, argon pressure test, and flatness check / horizontal plane to ensure the fitting met all of the client's expectations.

The part was only 3" x 4" overall, with flange face flatness held within an extremely tight tolerance of 0.002". The highly critical dimensional tolerances were achieved through the use of extremely talented craftsmen, and the proper type of welding equipment, which is recognized for its superior arc-shaping capabilities. Upon final completion, the flange received a full Helium Leak check test. HPS turned this special project around for our client within one week.



## The Result

Operating in the aerospace industry, where precision is critical, the client could not afford to risk any warpage. Based on their previous work with HPS and knowledge of our broad range of custom welding capabilities, the customer trusted us to carefully weld the fittings, minimize distortion, and lower the porosity level to a leak-tight fit.

HPS' industry expertise and strong collaboration with the client led to a quick and precise execution of the project. With our extensive track record and expertise in a wide variety of techniques, the client knew they were in good hands. The customer called and High Purity Systems delivered!