



Atlas High Radiation Products

Atlas Technologies has specialized in aluminum vacuum technology since its beginnings in 1992 when the company developed the Atlas bimetallic flange that brought aluminum to the forefront of UHV and XHV vacuum regimes. www.atlasuhv.com

The most recent advance at Atlas is the development of a 6000 series alloy that incorporates nanotechnology which Atlas fabricates into a variety of vacuum components. One of these components is the Atlas All Aluminum™ CF Flange specializing in a low CTE. All Aluminum™ flanges can mate to any stainless steel flange.

Atlas high radiation vacuum products can be welded using all aluminum welding techniques.

Chambers vacuum sealed with All Aluminum™ flanges have the following materials specifications:

- Low nuclear activation. Aluminum has a short neutron activated half-life measured on a scale of hours—significant when compared to the scale of stainless steel which is measured in thousands of years. This offers huge disposal savings and a priceless reduction in potential exposure to staff.
- Aluminum UHV chambers have low magnetic permeability and no measurable disruption to electron and ion optics.
- Coefficient of Thermal Expansion (CTE) matched close to stainless steel: (18.0 SS, 18.1 All Aluminum).
- Young's Modulus (88.5GPa) of elasticity (1/3 that of stainless steel; 207GPa). Aluminum offers outstanding vibration dampening, making it the material of choice for precision synchrotron, semiconductor, and physics applications where excess vibration can have disastrous consequences. Poisson's ratio : 0.3 Density : 2.87 [g/cc].
- Fluorine gas is a common cleaning agent in aluminum chambers. Aluminum chambers and aluminum gas delivery lines are far more resistive to fluorine than those made of stainless steel.
- Aluminum is 1/3 the weight of stainless steel.
- Thermal conductivity 20 ppm/°C 10x of SS: 21x the thermal diffusivity of stainless and extremely low thermal emissivity rates. Aluminum chambers bakeout quickly and evenly. The surface properties of aluminum allow full bakeout at 150°C — much lower than SS.

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- All Aluminum™ CF Flange: 1.33" to 10"
- Quick Release All Aluminum™ CF Flange: 1.33" to 10"
- All Aluminum™ ATCR mates with Swagelok VCR™ fittings
- Aluminum Gasket (replaces rubber gaskets)
- Atlas Foil X-ray positron window