MATERION

UHV CHAMBERS

Materion Electrofusion Ultra High Vacuum (UHV) Components

Research laboratories around the world have come to rely extensively on Materion Electrofusion's ability to braze or weld beryllium x-ray windows to simple or complex UHV chambers. These custom-built chambers are used for demanding and unusual x-ray diffraction applications including crystal growth and analysis.

Beryllium x-ray window equipped UHV chambers manufactured by Materion Electrofusion offer the following features and benefits:

- Unique and intricate designs
- Extremely accurate layouts
- Built-in water-cooling lines
- Leak tight and bakeable to 300°C / 450°C for Electron Beam welded / Brazed respectively
- Large angle x-ray transmission

Finished chamber assemblies are tested with a He mass spectrometer leak detector calibrated to a sensitivity of 1×10^{-9} atm-cc/sec.

Working with your design requirements, our engineers use CAD/CAM services to provide extremely accurate layout of detail components. Joints can be electron beam welded, TIG welded or even vacuum brazed, depending on your application's requirements. Cylindrical shapes can either be hot formed or machined as seamless cylinders. Materion Electrofusion's engineering department creates and submits approval prints of chamber designs for customer review and acceptance to make sure the final design will meet your needs and be manufacturable.

We are the world experts in the design and fabrication of chambers with integrated beryllium windows. Various window geometries are routinely fabricated, including electron-beam welded arc-segments (most common), 360° rings or sleeves and flat disks. Any material grade, from ultrahigh purity IF-1® (99.8% Be) to standard purity PS-200® (98.0% Be) can be selected depending on which is best suited for the application. UHV chamber housings are constructed using inside welds to eliminate virtual leaks. Welding beryllium to UHV chambers is accomplished through the use of an aluminum / stainless steel transition material. Should bakeout temperatures in excess of 300°C be necessary, the beryllium windows will be diffusion bonded to its housing in order to accommodate the higher bakeout requirement. Chambers can also be pre-qualified by thermal cycling to specified temperatures and time rates.

Differential pressure testing and vacuum bakeout under differential load are also available.

Health & Safety Note:

Handling solid beryllium material poses no significant health risks. However, as with many other industrial materials—materials containing beryllium may pose a health risk, if and when recommended safe handling practices are not followed and adhered to. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) have set mandatory limits on occupational respiratory exposures. Read and follow the guidance set forth in the Material Safety Data Sheet (MSDS) before working with beryllium. For additional information on safe handling practices or technical data on beryllium, contact Materion Electrofusion.

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